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EDINBURGH MEDICAL AND SURGICAL JOURNAL:

EXHIBITING

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OF THE

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IN

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The following works have been received :—

Illustrations on the Elementary Forms of Disease. By Robert Carswell, M. D., Professor of Pathological Anatomy in the University of London. Fasciculus 2d and 3d. London, 1833.

Principles and Illustrations of Morbid Anatomy ; adapted to the Elements of M. Andral, and to the Cyclopædia of Practical Medicine, (with which it will correspond in size,) being a complete Series of Coloured Lithographic Drawings, from Originals by the Author, with Descriptions and Summary Allusions to Cases, Symptoms, Treatment, &c. designed to constitute an Appendix to works on the Practice of Physic, and to facilitate the Study of Morbid Anatomy in connection with Symptoms. By J. Hope, M. D., F. R. S. Physician to the St Mary-le-Bone Infirmary, &c. Nos. I. II. III. IV. V. and VIII. London, 1833. 8vo. No. VI. and VII. not received.

Medicinisches Schriftsteller-Lexicon der jetz lebenden Aerzte, Wundärtze, Geburtshelfer, Apotheker, und Naturforscher, aller gebildeten Volker. Von Adolph Carl Pater Callisen. Copenhagen, 1830. Vol. 1st, 2d, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, and 15th.

We beg to inform the Editor and Publishers of this work, that we have received the foregoing volumes ; but, from some inadvertency, the 3d, 4th, and 5th, have never come to hand.—To our readers we have to say, that we shall take an early opportunity of giving an account of the object of it, as stated by its author, the laborious and indefatigable Professor at Copenhagen.

A Synopsis of Systematic Botany, as connected with the Plants admitted into the Pharmacopœias of London, Edinburgh, and Dublin, accompanied by a Planisphere, showing at one View, the Class and Order of the Medical Genera, according to Linnæus and Jussieu. By Thomas Castle, F. L. S. London, 1833. 4to.

Traité de la Vaccine et des Eruptions Varioleuses ou Varioliformes, ouvrage redigé sur la demande de Gouvernement. Precédé d'un Rapport de l'Academie Royal de Medecine. Par M. J. B. Bousquet. Paris, 1833. 8vo.

Surgical Observations on the Restoration of the Nose, and on the Removal of Polypi and other Tumours from the Nostrils. From the German of Dr Dieffenbach of Berlin ; with the History and Physiology of Rhinoplastic Operations, Notes and Additional Cases, by John Stevenson Bushnan. London, 1833. 8vo.

Facts establishing the Deleterious Properties of Rice, used as an Article of Food. By Robert Tytler, M. D. London, 1833.

The Medical Works of Paulus Ægineta, the Greek Physician, translated into English, with a Copious Commentary, containing a Comprehensive View of the Knowledge possessed by the Greeks, Romans, and Arabians, on all subjects connected with Medicine and Surgery. By Francis Adams, Esq. Surgeon, Author of Hermes Philologus. London, 1834.

Introduction to the Study and Practice of Midwifery and the Diseases of Women and Children. By William Campbell, M. D., Fellow of the Royal College of Surgeons, Edinburgh. Edinburgh, 1833.

Description of an Apparatus intended to facilitate the Treatment of Fractures of the Lower Extremity. By T. M. Greenhow, Member of the Royal College of Surgeons, London. London, 1833. 8vo.

Observations on Obstetric Auscultation, with an Analysis of the Evidences of Pregnancy, and an Inquiry into the Proofs of the Life and Death of the Fœtus in Utero. By Evory Kennedy, M. D., Lecturer on Midwifery, &c. With an Appendix, containing Legal Notes, by John Smith, Esq. Barrister-at-Law. Dublin, 1833. 8vo.

Thoughts on Medical Reform. By a Retired Practitioner. London, 1833. 8vo.

Illustrations of the Effects of Poisons. By George Leith Roupell, M.D.

On some points connected with the Anatomy and Surgery of Inguinal and Femoral Hernia. By G. J. Guthrie, F. R. S. London, 1833.

Signs of Pregnancy and Delivery. By W. F. Montgomery, M. D. London, 1833. 8vo.

Transactions of the Medical and Physical Society of Calcutta. Calcutta, 1833. 8vo.

London Medical Gazette for the Session 1833-34. from No. 51, September 21, Vol. XII. to No. 11, December 14, Vol. XIII.

The London Medical and Surgical Journal, from No. 85, Vol. IV. September 14, to No. 97, Vol. IV. December 7.

The Medico-Chirurgical Review and Journal of Practical Medicine, edited by James Johnson, M. D., &c. London. No. 36, April 1833; No. 37, July 1833; and No. 38, October 1833.

All Communications to be sent, Carriage or Postage paid, to Messrs Longman, Rees, Orme, and Co. London; or to Messrs Adam and Charles Black, Booksellers, Edinburgh.

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3. Cours D'Histoire Naturelle Pharmaceutique ou Histoires des Substances Usitées dans la Therapeutiques, les Arts, et l'Economie Domestique. Par A. L. A. Fée, Pharmacien, &c.
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5. A Manual of Materia Medica and Pharmacy, comprising a concise Description of the Articles used in Medicine; from the French of H. M. Edwards, M. D., and P. Vavasseur, M. D. Corrected and Adapted to British Practice by JOHN DAVIES, M. R. C. S.
6. A Supplement to the Pharmacopœia, and Treatise on Pharmacology in General; including not only the Drugs and Preparations used by Practitioners of Medicine, but also most of those employed in the Chemical Arts, &c. By SAMUEL FREDERICK GRAY,
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A Treatise on Diseases and Injuries of the Nerves. By Joseph Swan. London, 1834. 8vo.

Thoughts on Materialism; and on Religious Festivals; and Sabbaths. By Henry Bradshaw Fearon. London, 1833. 8vo.

A New View of Nature of Inflammation; with Cases of Croup and Bronchitis, and its Treatment. Use of the Thymus Gland. By William F. Bow, M. D. Edinburgh, 1834. 8vo.

An Introduction to the Study of Human Anatomy. By James Paxton, Member of the Royal College of Surgeons, &c. London, 1834. Vol. ii. 8vo.

Outlines of the Anatomy and Physiology of the Teeth, &c. By David Wemyss Jobson, Member of the Royal College of Surgeons, &c. Edinburgh, 1834. 8vo.

Graphic Illustrations of Abortion, and the Diseases of Menstruation. With Plates. By A. B. Granville, M. D., &c. &c. London, 1834. 4to.

The Parents' Dental Guide; a Treatise on the Diseases of the Teeth and Gums, &c. By William Imrie, Surgeon-Dentist. London, 1834. 8vo.

Medica Sacra; or Short Expositions on the more Important Diseases mentioned in the Sacred Writings. By Thomas Shapter, M. D., &c. London, 1834. 8vo.

On the Influence of Minute Doses of Mercury, combined with the Appropriate Treatment of Various Diseases, &c. By A. P. W. Philip, M. D., F. R. S., &c. London, 1834. 12mo.

On Dentition, and Some Coincident Disorders. By John Ashburner, M. D., Member of the Royal College of Physicians, &c. London, 1834. 12mo.

Medical Biography, A. and B. By James Atkinson, Surgeon to H. R. H. the late Duke of York, &c. London, 1834. 8vo.

Observations on the Utility of Fumigating and other Baths; with a Summary of the Treatment of Ninety-two Important Cases. By Jonathan Green, Member of the Royal Coll. Surg. &c. London, 1834. 12mo.

An Investigation into the Remarkable Medicinal Effects resulting from the External application of Veratria. By Alexander Turnbull, M. D. London, 1834. 8vo.

A Demonstration of the Nerves of the Human Body, consisting of Four Parts. By Joseph Swan. Part iv. London, 1834. Imperial Folio.

The Anatomy and Physiology of the Liver. By Francis Kiernan, Esq. London, 1834. 4to.

Le Censeur Medical Journal de Literature, de Philosophie et de Bibliographie Medicales, Francaises et Etrangeres. Janvier 1834. Tome i. Paris, 1834. Pp. 116.

Liverpool Medical Gazette. No. 3, March 1833, to No. 12, December 1833.

The Monthly Archives of the Medical Sciences, January 1834 to March 1834. London.

London Medical Gazette for Session 1833-34. From No. 12, December 21, to No. 24, March 15, 1834.

London Medical and Surgical Journal. From No. 98, December 14, to No. 111. Vol. v. March 15, 1834.

Transactions of the Medical and Physical Society of Calcutta. 8vo. Vol. vi. Calcutta, 1833.

Baltimore Medical and Surgical Journal and Review. Baltimore, 1830. No. I. 8vo.

CORRIGENDA.

In p. 74, line 12, *for* "were opaque," *read* were opaque by "incipient steatomatous deposition;" and cancel the latter words in line 14th.

In p. 260, line 8, *for* removing *read* removed.

In p. 273, in line 11th from the foot, prefix III. before the title PATHOLOGY OF FEVER.

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1. JANUARY 1834.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Second Medico-Chirurgical Report of the Huddersfield Infirmary.* By WILLIAM TURNBULL, M. D. Physician to the Institution.

THIS Report embraces the twelve months commencing 29th June 1832, being the second year since the establishment of the Infirmary.

In a medical point of view, it has been a period of great interest. Epidemic has followed epidemic in quick succession, and, occasionally, two or three have prevailed together.

During the winter before last several of the villages to the south of Huddersfield suffered severely from fever of a low protracted kind. With the spring, however, it subsided; and was followed in May and June by measles, which prevailed to a great extent. I had in my own family two little sufferers, who went favourably through the disease; and indeed it was generally of so mild a type, as scarcely in any instance to prove fatal.

To measles succeeded, or, I should rather say, was superadded, cholera; for the former complaint still continued to show itself. So early as the beginning of April, I attended a case along with Mr Bennett of Almondbury, which we had no hesitation in pronouncing genuine cholera. It occurred in the wife of an inn-keeper. I was called to her on Tuesday the 3d of April, at five in the afternoon, and found her in the following state. She was restless, tossing from one side of the bed to the other, and moaning much; her countenance was haggard and fallen; forehead bathed with viscid sweat; the eyes were sunk, and surrounded with dark *areolæ;* and the cheeks of a dark mahogany colour. The breath, and likewise the face, neck, and upper extremities felt cold; and the hands and fore-part of the chest were of a dark hue. The lower half of the body had its natural warmth. The pulse at the wrist was only now and then perceptible; the beat of the heart feeble, and about 90; the respiration calm; and the voice weak. She had vomited much for a few hours, and had passed several stools, consisting of rice-water-looking fluid, with loose flocculent shreds in it. No urine had been voided for some time. She still possessed considerable muscular strength; her faculties were entire; and she begged not to be disturbed, as she felt convinced that nothing could be done for her. Her illness was attributed to getting damp in the feet on the preceding Tuesday; as on the following day she was seized with diarrhœa, but attended as usual to her household affairs until the Friday, when she took to bed, complaining of general weariness in her limbs, and aching about the loins. The lax continued, but the pulse never exceeded 80; and even on the morning of the day on which I saw her, she felt so well as to be desirous of coming down stairs. About 1 P. M., however, she suddenly altered, and the above symptoms supervened. She lived until seven the following morning.

This proved a solitary case. Nothing at all similar occurred, either in my practice, or in that of any of my professional friends, until July. On Monday, the 9th of the month, I accompanied Mr Greenwood to Leehead, a small village about a mile from Huddersfield, to visit Charles Butterworth. We found him with sunk countenance; indistinct pulse; cold extremities; moist but dirty tongue; breath cold; trunk warm; and senses perfect. He had had many loose stools, of a gruelly appearance, and some cramp. His illness had commenced soon after breakfast on the previous Friday, with sickness and vomiting, which continued to recur until the exhibition of an emetic on the evening before our visit, after the operation of which there had been no more vomiting. Butterworth was a steady hard-working man—had previously enjoyed good health—and could assign no cause for the attack. He sunk about 2 A. M. on the 10th. Could any doubts have been entertained as to the nature of his disease, the next case was well calculated to dispel them.

Mary Calton, a stout active woman, who lived next door to

Butterworth, and who had assisted in laying out his corpse on the Tuesday, was attacked with vomiting and purging at 2 A. M. on the Friday, and dead by 1 P. M. the same day, having been scarcely eleven hours ill.

The week preceding the occurrence of these cases, four deaths from bowel complaints had taken place in the work-house, which stood a very short distance from the spot where Butterworth and Calton resided. And subsequently a good many other cases occurred, both in that establishment and at Leehead; whilst the surrounding villages altogether escaped; and only two or three cases were met with in Huddersfield.

How, then, did the malady originate in this instance? The cases in the work-house were clearly the first, with the exception of the solitary instance in April; and that building was at the time extremely crowded—not over-cleanly—and in some parts damp and ill-ventilated—in short, altogether in a state highly favourable for engendering disease. * The nearest infected district, I believe, was Wakefield; and no communication with that, or any other quarter where the disease prevailed, could be traced. I may likewise state that, although Butterworth's house was a good one, and cleanly, two drains run under the stone floor, and a small rivulet washes against the end wall.

These are circumstances strongly in favour of its local origin; and, in the absence of all proof to the contrary, I believe such to have been the case. But while I admit this, I am not the less convinced that the disease may be spread by personal communication. In this way only can I reconcile the conflicting opinions of the contagionists and non-contagionists, men of equal powers of observation, of equal experience, and of equal veracity. Both, I think, are wrong in maintaining the *exclusive* operation of one cause. There is nothing incompatible, nothing inconsistent with what occurs in other diseases, especially continued fever, in allowing that cholera may arise spontaneously, that is, from some unknown cause; and also that it may be propagated from man to man. The cases I have already detailed, bear strongly on the former point; and the following melancholy narrative is not less decided in support of the latter.

The family to whom it relates consisted of four individuals, viz. John and Grace Duckworth, with a daughter and her husband. They lived at Scaurfoot, a retired situation a little to the left of the old road to Halifax, and about two miles distant from this town. It is a solitary house, and stands pleasantly on a gentle acclivity in the corner of a pasture field.

---

* From improvements now in progress, I am happy to think that such a state of things is not likely again to recur in this establishment.

The old man, John Duckworth, was seized with looseness while in Manchester, where the cholera then prevailed, and, fearing he had got the complaint, he made the best of his way home. This he reached on Monday the 13th of August, but so altered in voice and appearance, that his family scarcely knew him. He lived until Friday the 17th, and was interred on Tuesday the 21st.

It was reported that the attendants at the funeral indulged rather freely in the use of cordials, for the purpose of guarding against infection. Be this, however, as it may, the daughter, aged about 40, was attacked with vomiting and purging on the following day, and died on the 23d, after an illness of thirty hours.

On the 24th, I visited Grace Duckworth, aged 69. She was under Mr Atkinson's care. I found the corpse of the daughter lying in the house; and the old woman sitting by the fire, with the body bent forwards, and the elbows resting upon her knees. She told me that she found herself easier in this posture than in bed. Her illness had commenced on the preceding day, with vomiting, purging, and cramps. The pulse at the wrist was imperceptible; the countenance ghastly; the eyes were surrounded with a dark circle; the hands cold and damp; and the stools frequent and watery. She could not say whether she voided any urine since the commencement of her illness. She was released from suffering on the 26th, having kept the bent sitting posture until nearly the end.

Thus three members of the family sunk under the malady within a few days of each other. Another victim, however, yet remained. Sally Reid, a florid robust woman of 69, noted in the neighbourhood as a midwife, had come to wait on the Duckworths as nurse. At one of my visits, on my requesting her to remove some soiled linen and evacuations out of the house as speedily as possible, she told me she had no fear of infection, as long as she could have her pipe and her glass, both of which, I believe, she used freely. Sally's prophylactics, however, proved unhappily no better than those emanating from more learned heads. I was requested to see her on the 30th of August, and, meeting Dr Walker on my way, he went along with me to Scaurfoot, and a sad spectacle we beheld. She was laid on the floor in a state of hopeless collapse, with the features shrunk, the hands cold and blue, the pulse gone, rice-water fluid trickling insensibly from the *anus;* and her robust and bulky frame diminished to half its dimensions two days before. Her mental faculties were entire, and she knew perfectly that a few hours would close her earthly pilgrimage. We ascertained that she had laboured under diarrhœa for the two preceding days, but thought nothing of it, as she scarcely felt ill until early on the morning of the day we visited her, when vomiting began, and was rapidly followed by the collapse. After Reid's decease, the only surviving member of this devoted family forsook the house, which has remained, and in all probability will long remain, without another inhabitant.

Upon the whole, however, this district suffered comparatively little from cholera, that disease having been confined in a great measure to the small hamlet of Leehead and the work-house. I believe, in all there were fifty-three cases, and nineteen deaths. The weather during the prevalence of the malady was chiefly remarkable for its variableness; and the wind, although seldom long in one direction, was more from the north and east than is usual in July and August.

On the cessation of cholera, scarlet fever made its appearance. One of the first cases I met with was one of *Scarlatina anginosa*, in a little boy of my own, which was ushered in by convulsions. It occurred in the end of September. Subsequently the disease became very general, and in its most malignant form. Great numbers of children, and some adults, were cut off, more especially to the south of Huddersfield, in and near Almondbury. Delirium set in almost from the first; the heat was irregularly distributed; the eruption indistinct; the pulse rapid and feeble; and the throat speedily became gangrenous. Generally, also, the neck was greatly swollen. In the majority of the fatal cases death happened on the fifth day; in not a few on the fourth; and in some still earlier. I knew of one instance of a servant girl, 18 years of age, in a family which had previously lost by the malady one of its members, to whom the girl was much attached, who began to complain on the Sunday evening, had a slight show of the eruption on the Monday, and died early on the Tuesday morning,—the duration of her illness having been less than thirty-six hours.

When the disease commenced with such intensity, remedial means proved of little avail. In some cases, however, ammonia, quinine, wine, and the warm-bath, appeared to be beneficial, and to abate the extreme restlessness which characterized most of the cases; but, on the whole, the results of treatment were far from satisfactory. November was the most fatal month, and onwards to January many continued to sink.

During the prevalence of scarlet fever, small-pox and hooping-cough were not unfrequent; and cases of measles were still to be met with. The latter retained the same mild type that it presented in the early part of summer; whilst the small-pox proved very virulent and fatal. It affected many after vaccination; but in such cases it was deprived of its malignity; and in no instance with which I am acquainted did death ensue.

The last epidemic that I have to mention is the influenza. It began in the middle of April—was at its height in the first week in May—and on the close of the month, had in a great measure subsided. It is somewhat singular that it affected the town earlier, by at least a week, than the adjacent villages. It has been by far the most universal epidemic I have witnessed. Scarcely any family altogether escaped; and in many the whole were more or less affected. In old and debilitated subjects, and in those labouring under chronic disease in the thorax, it proved exceedingly lingering and intractable, and in some few cases fatal. Blood-letting appeared to me to render the cases where it was practised more obstinate.

During the last sixteen or eighteen months, therefore, (I write in July 1833,) the district of which Huddersfield is the centre, suffered from continued fever, measles, cholera, scarlet fever, small-pox, hooping-cough, and influenza. Fever, cholera, and scarlet fever, were partial in their visits, and adhered to particular villages with great pertinacity; whilst places immediately adjoining were altogether exempt. Thus, the first prevailed chiefly in Mold-Green, Dalton, Kirkheaton, and Almondbury; the second at Leehead, and in the work-house; and the last at Almondbury, Castlehillside, and Huddersfield. On the other hand, *rubeola*, *variola*, *pertussis*, and influenza, exhibited no attachment to any particular locality, but were almost universal in their diffusion.

The number of in-patients received into the Infirmary during the last year has been 116; and of out-patients under treatment in the same period, 3173; whilst the expenditure of the charity has amounted to L. 967.

Table of Diseases of In-Patients.

Abscess,	5	Joint disease, shoulder,	1
Amaurosis,	3	——— elbow,	1
Bladder, disease of,	5	——— knee,	13
Bronchitis,	1	——— ankle,	3
Bruise,	9	Laryngitis,	3
Burn,	1	Ophthalmia and opacity,	8
Caries,	7	Paralysis agitans,	1
Chorea,	1	Paraplegia,	3
Dropsy,	3	Periostitis,	2
Erysipelas,	1	Peritonitis,	2
Febris,	1	Pneumonia,	1
Fracture,	5	Psoriasis,	1
Hare-lip,	1	Purpura,	1
Inflamed hand,	1	Rheumatism,	3
Insanity,	1	Rigidity of joints,	2

Spinal deformity,	1	Ulcer,	6
—— irritation,	4	Vomiting,	1
Stone,	1	Wound,	2
Stricture of the rectum,	1	Wry-neck,	1
Tumour,	9		

Amaurosis.—Maria Harrison, 28 years of age, from Longwood, was admitted under the care of Mr Wilks on the 21st September She had a heavy stupid cast of countenance, much vertigo, and total blindness. Both pupils were dilated and immoveable. She attributed the disease to being knocked down with a poker about eight months previous to her admission. The blow had caused a wound over the upper edge of the frontal bone, at its junction with the parietal and temporal; and she had at the time some fits. Several pieces of bone had come away soon after the injury, and the wound had long been closed. Still some small spicula could be felt loose beneath the cicatrix, and pressure on these excited much pain.

An incision was made, and two pieces of bone extracted. She was cupped, took mercury to ptyalism, and had an issue cut in the course of the sagittal suture. Blisters were likewise applied from time to time, and a seton inserted at the nape. No improvement, however, had taken place at the end of two months, and she was made an out-patient. I have learnt since from Mr Sedgard, our late apothecary, that Harrison had more convulsions, and died rather suddenly, about four months after leaving the Infirmary.

William Greenwood, æt. 40, from Rushworth, came under the care of the writer of this report on the 30th December. He was a stout healthy-looking man, with a good deal of colour, and very prominent eyes. He complained of total blindness of right eye, and partial of left, pain in his head, noise in his ears, and staggering in his gait; and, on turning his head or stooping, he felt giddy, and inclined to fall forwards. The iris of both eyes contracted freely, but that in the right somewhat irregularly. In all other respects, he enjoyed excellent health. The affection of the right eye had existed three years, and that of the left for about half that period. He had been under treatment at the Halifax Dispensary, and had been bled and blistered repeatedly, and a seton had been inserted in the nape. His head was shaved and blistered, and he was leeched and cupped again and again, and mercury was likewise given, so as to excite gentle ptyalism. At one time he thought there was some amendment, but it was not permanent. He had next the supra-orbitar region denuded of cuticle, and strychnia daily applied; afterwards he took iodine, and had a strong hydriodate of potass ointment rubbed over the scalp; and lastly, he tried electricity, and an issue on the course of the sagittal suture. Nothing further could be done, and he went out in a hopeless condition.

Edwin Ramsden, æt. 14, admitted under the care of the writer on the 26th May. He was blind of both eyes, and complained of vertigo, singing noises in his ears, and pains in the head, neck, and lower extremities. He had slight chills in the afternoon, restless nights, and vomiting about every other morning. Tongue was coated and moist; pulse 104; appetite tolerable; bowels were sluggish, and pupils large and fixed. The blindness had only existed a month, but he had suffered much from pain of head for six months. He knew no cause for the affliction, except that he had worked in a coal-pit for four years, and seldom been dry in his feet. He had undergone no medical treatment. The hair was taken off, and cold lotions, leeches, blisters, and tartar emetic, were successively applied to the scalp. He likewise used cathartic and mercurial medicines. These had the effect of greatly lessening the headach and the vomiting, and the pupils regained some motion. A seton was put in the nape, and an issue on the crown of the head; and he still remains in the Infirmary, with slender hopes of the restoration of sight.

All the three cases, I think it pretty evident, depended upon organic disease in the *encephalon*.

Bruise.—There have been nine cases of this kind of accident, none of them possessed of much interest.

John Potts, from Mirefield, æt. 16, had got his little and ring-fingers entangled in machinery five days before his admission. Much erysipelatous inflammation and vesiccation had come on, and extended up the arm. With rest, however, and cataplasms, he speedily got well.

Thomas Sykes, æt. 21, from Slaithwaite, had been caught the night preceding his admission by the *pelvis*, between his boat and the archway of the Marsden Tunnel. The crush had been severe; and, when brought to the Infirmary, he was unable to walk, and complained greatly of pain at the pubic symphysis, the sacro-iliac junctions, and down the inner and foreside of left thigh. He had been bled to twenty ounces at the time of the accident; and with rest, topical bleeding, and free purgation, he went home well in a month from the date of the injury.

James Hutchinson, also from Slaithwaite, had the *gastrocnemii* muscles much contused, by the wheel of a cart passing over the leg. There was no fracture, and his recovery was rapid.

Caries.—Mary Shaw, æt. 20, from Slaithwaite, was admitted under Mr Wilks on the 9th November. This girl had had the finger removed in the Infirmary in the preceding March. In my history of her case, as given in last Report, and published in this Journal, I stated that there was some enlargement over the lower end of the *ulna*. Soon after her dismissal, the fore-arm began to swell and be painful; and in September an abscess burst, and exposed some carious bone. The elbow also became stiff, and her general health declined. She derived little benefit, and again went home; but once more returned in March, with a large tumour in the right groin, evidently a psoas abscess. The event may easily be prognosticated.

Fracture.—In the first year of the Infirmary twenty-one cases of fractured bones were admitted, of which four were caused by machinery. During the past twelvemonths, one is the result of the same agent, and five cases in all have presented themselves. One arose from fighting,—one from the kick of a horse,—one, as just stated, from machinery,—and two from falls. One of the latter, a compound fracture of the leg, in an old man, John Iscarnley of Hopton, proved fatal, apparently from sloughing of the back.

Insanity.—This patient was sent out as soon as the nature of her complaint was satisfactorily ascertained, it being against the rules of the institution to admit cases of insanity.

Joint, Disease of.—Charles Holiday, æt. 40, from Kirkheaton, was admitted by Mr Wilks on the 20th September. He looked stout and healthy, and complained of nothing but loss of power and sensation in his left upper extremity. It was greatly enlarged from the shoulder point to the finger ends, and possessed its natural colour and temperature. The muscles felt somewhat hard; and, over the back of the *carpus*, there existed a ganglion the size of half an orange; and, on the front of the shoulder joint, a large tense bag, apparently of a similar nature. From the great enlargement, the head of the *humerus* could not be felt, although it was clearly not in its proper site. He could move the limb a very little backwards and forwards, but not raise it up in the least. At the same time, it admitted of being raised over his head, and moved in all directions by others. Indeed, the roughest handling gave him no pain; and the natural points of the thumb and two adjoining fingers were as if sliced off, having been often burnt and otherwise injured, without his being aware of it. This loss of feeling had existed seven or eight years; and he attributed it to his having fallen asleep in the sitting posture, with his arm stretched out before him, and resting on its inner side on the back of a chair. How long he remained in this position he could not tell; but, when he awoke, the arm was numb, and remained so ever after. He could always, however, raise it up and use it until six days before his admission, when it suddenly became powerless in the reaping-field, and the hook which he at the time was using fell from his grasp. The swelling likewise only commenced from that period.

The tumour in front of the joint was tapped with a fine trocar, and a gill of colourless fluid drawn off. The *humerus* could then be readily reduced, but the weight of the arm immediately dislocated it again. The *Tinct. Iodini* was freely applied to the shoulder and arm, with the effect of greatly reducing the size; and he wore a bandage, so as to retain the limb in its proper place. At the end of his two months, it was found that the arm kept reduced when the bandage was removed; but still he had no command over it. In this state he left the hospital. About the end of January I again met with him. The arm was out of its place, and hung dangling by his side. It could not be kept reduced without the bandage, of which he had tired. The shoulder and arm were nearly of their natural size, but the fingers and whole hand remained stiff and swollen.

That the cause assigned by Holiday for his complaint was the true one, I can readily believe. The nerve, injured by the pressure against the back of the chair, had never recovered its functions; hence the loss of feeling. The dislocation, I am of opinion, took place first in the reaping-field, when he lost all command over the limb; and the pressure of the head of the humerus, in its new situation upon the vessels in the *axilla*, will satisfactorily explain why the enlargement should commence at that period.

I remember attending a case of paralysis of the face, produced by a similar cause to that of Holiday's arm. It occurred in the spring of 1825, in a middle-aged gentleman, a patient of the late much-lamented Mr M'Gown of Skelmanthorpe. He had fallen asleep with the right side of his face resting upon the wooden arm of a sofa. When he awoke, he felt much pain about the ear, and over the right half of the face; and, in a few days, the mouth and cheek were greatly drawn over to the left side. He presented no other symptom of disease, and I had much satisfaction in assuring him that there was no cerebral mischief, but that the palsy depended upon an affection of the *portio dura* in front of the ear. With repeated leeching and blistering, the face slowly regained its former symmetry; and the gentleman is now in good health.

Margaret Barraclough, æt. 45, from Meltham, came under Mr Robinson's care on the 13th July. Both knees were much enlarged forwards and laterally, of their natural colour, and free from pain. Fluctuation was distinct. They had been three years in attaining their present magnitude. Her general health was pretty good, except that the catamenia were not altogether regular. She could walk a good distance. By blisters, iodine, and compression, the size of the knee-joints was much diminished, and she left the Infirmary.

There have been in all eighteen admissions for joint disease. Twelve of these were males, and six females; and eight were under twenty years of age. Thirteen were for disease of the knee,—three of the ankle,—one of the shoulder,—and one of the elbow. Five amputations were necessary, viz. three above the knee, one above the ankle, and one above the elbow.

Paralysis Agitans.—Martha Haigh, æt. 29, from Scammonden, came under Dr Walker's care on the 29th December. She laboured under constant tremor, except when laid down, of the head, and both upper and lower extremities. The left arm and leg were more affected than the right. When she attempted to walk, she was forced upon her toes and into a running pace, so great was the tendency to fall forwards. In feeding herself, she scattered the greater part of her food before it reached her mouth. She had much coldness of the legs, pain in the lower part of the spine, and incontinence of urine. Pulse was natural; appetite good; bowels were slow; and nights passed without any refreshing sleep. She attributed her illness to a severe labour four years previously, as, soon after it, she had numbness of the lower extremities, and inability to retain her water; and two years subsequently to the appearance of these symptoms, the shaking commenced. The poor woman had been ill fed, and otherwise undergone many hardships. With blisters, stimulating liniments, attention to the state of the alvine discharges, and chalybeates, she regained a good degree of flesh and strength; and the shaking was so much lessened that she could feed herself comfortably, and even use her needle a little. She likewise regained some slight command over the bladder, and in this state left the house. The return to a comfortless home brought on an aggravation of all her symptoms, and she only survived her dismissal two months.

Paraplegia.—Edward Cowgill, æt. 28, from Denby, entered as Dr Walker's patient on November 9th. He was a muscular, healthy-looking man; and complained of vertigo, noise in his left ear, and loss of power in his lower extremities. He could draw up the right leg a little, and slightly move the toes; but had no power over the left, which had lost all sensation below the knees. The disease had come on rather in a sudden manner about nineteen weeks previously, and was attributed to getting cold when overheated with mowing grass. He had been bled and blistered, and had been subjected to the influence of issues and electricity, before his admission. He was again cupped and blistered repeatedly; and tried various liniments and medicines; and strychnine was applied to the lumbar region of the spine, without affording any relief.

I was lately in the neighbourhood where he resides, and found that he remained without any perceptible alteration.

Stephen Hellawell, æt. 10, from Elland-Edge, came in as the writer's patient, June 1st. He was a diminutive boy, with a pale countenance, and somewhat absent manner. He had completely lost the use of his lower limbs. They felt cold as high as the knees, and their sensibility was much impaired. His appetite was poor; tongue clean; skin cool; and pulse 84, soft and unequal. The urine was reported to come away involuntarily; his bowels were open; nights tolerable; pupils natural. The disease was only of three weeks' duration, and had come on during an attack of the influenza, although before that he had not been stout. He had been employed as a card-setter; and had used no remedies. He was freely purged and blistered, and took mercurial and other medicines without benefit. The symptoms gradually became worse. He had pain of head and vomiting. The pupils became sluggish, and his pulse fell to 60,—a clear indication of what was going on in the encephalon. Towards the latter end he lay in a torpid state. His teeth became covered with black sordes; his stools and urine came off in bed; and he sunk on the 21st June, six weeks from the commencement of the paralysis.

Mary Ann Haigh, æt. 25, from Emley, admitted under the writer's care, 24th March. She complained of pain in the head and abdomen, and down the spine, and loss of power in her lower extremities. The tongue was white; the pulse 106; the bowels torpid; the nights restless; and the catamenia regular. Pressure on several parts of the spinal column caused considerable pain, which darted round into the front of the body. The affection had begun nineteen months before admission, with pain of the head and back, which was followed in a fortnight by inability either to walk or stand; and she had been confined to bed fourteen or fifteen months out of the nineteen. She had been under medical treatment, and been bled and blistered without much benefit. She took various medicines, had the mouth slightly affected, and was cupped over the tender parts of the spine. No amendment followed; and two caustic eschars were then formed on each side of the lumbar region of the spine. These relieved the pain in the lower part of the back; and in a fortnight after they were made, she felt she had some return of command over her limbs.

Towards the end of April, the eschars having all come out, and the sores being nearly healed, the caustic was again applied in a similar manner as before, a little higher up the spine, where she complained of much pain darting round into her breast, and up into the head. As soon as these eschars began to separate, her amendment was very decided. The fever abated; the appetite improved; the bowels were easily regulated; and the sleep became sound and refreshing. In another month, a repetition of the caustic still higher up the spine was considered advisable; and at the end of four months from her admission, she went home quite restored.

Psoriasis.—Duke Moorhouse, æt. 28, from Holmfirth, came under the writer's care 17th November. He was a diminutive man, of sickly sallow aspect, and by trade a tailor. The whole of his back and breast, with the greater portion of his extremities, was covered with a scaly eruption, mostly dry, but in some places red and irritable. He felt weak and unfit for exertion. The tongue was white; the bowels open; the pulse natural; and the nights bad. The complaint had existed five years; and he had been at Harrogate, and tried many plans of cure without deriving any advantage.

He was bled; took ten grains of the compound calomel pill every night, a purgative in the morning, and was put upon low diet. The blood drawn had a strong white coat, and was much cupped. Its loss seemed to relieve him, and the venesection was repeated in three days; but the blood thus taken had very little of the buffy appearance. He took the *Decoct. Dulcamaræ*, with *Potassæ Nitr.* and *Sulphur. Præc.* thrice a-day, and applied the *Ung. Hyd. Præcip. Alb.* to one arm. The eruption declined, and was less irritable; and altogether he decidedly improved, although the arm to which the ointment had been applied did not get on faster than the other parts. The ointment was therefore changed for the *Ung. Picis;* and ultimately equal parts of this and *Ung. Hyd. Nitr.* were used. Under this plan his recovery was uninterrupted; and at the end of his two months the cure was complete.

I attach much weight to the dietetic regimen this patient was put under in the Infirmary. I doubt greatly whether the same treatment would have effected a cure so speedily, or at all, had the low diet not been strictly enforced. It is one of the most important advantages of an hospital, that we can not only prescribe, unfettered by objections and prejudices, whatever we deem best calculated to benefit the sufferer, but likewise that we can depend upon our plans being faithfully carried into execution.

Purpura.—Thomas Whitely, æt. 19, from Butts Green, admitted as the writer's patient on the 10th August. He was of small stature, fair complexion, and spare habit. Complained of troublesome cough, bloody expectoration, shortness of breathing, and inability to lie comfortably except on right side. The pulse was 100, and soft; the tongue of a dirty yellow hue; thirst considerable; appetite poor; urine high-coloured; the bowels were costive; and the nights restless.

Over the cutaneous surface of both inferior extremities, as high as the knee, were many small spots, from the size of a flea-bite to that of a split-pea. Some of them were bright-red, and others of a faint dusky hue. The flesh of his legs and arms felt lumpy, or had hard places, which disappeared frequently, while others came in their place. The whole of left side of chest sounded dull on percussion, and the respiratory murmur was extinct.

He had enjoyed good health until four or five months previous to his admission, when he was seized with cough and bloody *sputa;* and twice in the preceding five weeks he had vomited a large quantity of blood, (his mother thinks a quart each time.) The spots had been observed seven weeks, and had varied greatly. Sometimes they reached half-way up his thighs; and he had observed that after each vomiting they had nearly disappeared. He could assign no cause for his seizure; and had used few remedies.

He remained in the Hospital until the 16th September. During this time he was twice bled, (the blood being buffy and cupped both times,) and repeatedly blistered on the chest; took opening and saline medicines, and colchicum, turpentine, &c. without any permanent benefit. He also had a seton over the region of heart. Towards the end of his time, the pulse got up; the spots went completely away; and his mental faculties became deranged. In this condition he was removed by his friends; and I heard of his decease soon after.

Stone in the Bladder.—Mary Wood, æt. 48, from Austonley, admitted under Mr Robertson, 12th September, labouring under symptoms of *calculus vesicæ*, which had afflicted her for twelve months. On being sounded, a stone was readily detected, and she consented to its removal. This was effected on the 19th September by the forceps, after the use of Weiss's dilator for an hour. The stone weighed 167 grains; was shaped thus, rough exteriorly; 1 inch and a-half in length, by 1 in breadth, and ¼ inch in thickness. Some irritation ensued, which required leeching; but she went home well on the 28th September.

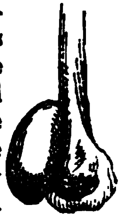
Calculus is exceedingly rare in this district. I have resided in Huddersfield nineteen years, and have only known of another female case. Further, I do not think that more than nine or ten operations on the male have occurred during the last twenty years. The population may be estimated at 130,000.

Tumour.—Richard Woodhead, æt. 50, from Upper Thong, admitted under Mr Robertson, July 18th, for a tumour in the right *axilla* of the size of an orange. It was firmly adherent to, or rather projected from, the nerve, apparently the radial, thus, and had a smooth surface, tense elastic feel, and was of its natural colour. It was exceedingly tender to the touch, especially near its base. Indeed, pressure made him start as if an electric shock had been given. The tumour had existed six or seven years; was the size of a small bean when first observed; and had only become painful about three years before his admission, when it began to " stang" down his arm into his fingers. No cause could be assigned for the affection; and in all other respects he enjoyed good health. He had consulted many practitioners respecting it, and tried various plasters and poultices; and an attempt had been made to excise it, but not persevered in. The day after his admission the tumour was tapped, and an ounce and a-half of limpid fluid taken away. The operation gave considerable pain, but it lessened the tumour materially, and permitted the arm to be brought closer to the side. He went out much pleased with the speedy, although, most probably, only temporary, relief he had obtained.

This is a good example of *Neuroma*, on which rather rare complaint Mr William Wood has published some excellent observations and cases in the Edinburgh Medico-Chirurgical Transactions. Would injection of the cyst be likely to diminish permanently the size of the tumour, or prevent its increase?

John Burdett, æt. 80, from Denby, came in as Mr Robinson's patient, July 27th. A fungous growth projected from the left temple and upper part of the malar bone. It was immoveable, circular in shape, about three inches in diameter, and might rise in its most prominent part nearly 1½ inches. It often bled copiously for a few minutes. He thought it arose from the scratch of a comb, which had been prevented healing by the pressure of his hat. He had been under treatment three months; and at one time it seemed nearly taken off; but it speedily regained its former magnitude. It was excised as completely as possible, and the actual cautery run over the bleeding surface. Several ligatures were likewise requisite. The substance removed was firm and uniform in its structure, like boiled cow's udder,—the mammary sarcoma of Abernethy. The cicatrization went on well at first, and then seemed suddenly arrested; and some fungous shoots re-appeared. In this state the old man went home, and would not long survive.

Sarah Dyson Rawcliffe, æt. 24, from Smith Riding, admitted under Mr Robinson, 19th October, for an enlargement just above the knee. It had a doughy feel, and was smooth, and accompanied by intense deep-seated pain. The pulse was rapid, and she could obtain no good rest. The swelling had been eight months in progress; and the patient attributed it to a blow against the sharp edge of an oven door. Nothing had been of the slightest service. Various plans were tried, but all failed in affording her any ease. On the contrary, the pain became worse; the part increased in magnitude; and her appetite and strength failed. Under these circumstances, the limb was removed on the 15th January. The disease was found to originate in the *femur* above the condyles. The forepart of the bone was destroyed; and a medullary mass projected forwards and overlapped in some degree the joint, without penetrating its cavity. It measured 6 inches long, by 4½ in breadth, and about the same in depth. Externally it resembled the surface of the brain; and internally consisted of white medullary substance, which gradually became of less consistence as it was traced inwards to the centre of the *femur*, where it resembled soft pulp. It was, in short, a case of medullary sarcoma; and, had the disease been allowed to proceed until the integuments had given way, it would have presented a fine specimen of that intractable complaint. It is perhaps better known in this neighbourhood by the term *Fungus Hæmatodes*, as given to it by the late Mr Hey of Leeds.



The operation was followed by much faintness for a long time; and the pulse never came down to its proper standard. She went home, however, in a tolerable state of health on the 8th February. Soon after she got cold, had an attack of pleuritic inflammation, which terminated in effusion; and she sunk under it on the 18th March.

Benjamin Taylor, æt. 37, from near Honley, came in on the 22d February under Mr Robinson, for a large, solid, and rather hard tumour on the right side of the neck, commencing near the upper cervical *vertebræ*, and standing forwards and downwards to near the clavicle. It was moveable; and the finger could be introduced between it and the vessels of the neck. The surface was uneven or nodulated, and traversed by large veins. It had existed many years, slowly increasing in size; and no cause could be assigned for its production. The patient was fleshy, but had a sallow aspect; and his mind was greatly agitated at the thoughts of the operation, although he had come in expressly to have the part removed. So great, however, did his trepidation become, that he could neither eat nor sleep; and ultimately he made an abrupt departure. The operation was afterwards performed at his own house on the 2d of March. The tumour proved of the pancreatic kind, and weighed 6½ ounces. His recovery was rapid; but probably a return of the malady may be looked for.

Charles Hellawell, æt. 21, from Thurstonland, was admitted as

Mr Atkinson's patient, April 12th. He had a large hard swelling, not very well defined in its limits, on the lower and back part of the right thigh. It had existed nine weeks, and had come without any obvious cause. He had something similar on the leg last year, which went away without anything being done for it. His looks were exsanguious and thin, although he said his health was good. Leeches were applied to the part, and very great difficulty was found in arresting the bleeding. He then told us that he belonged to a "bleeding family,"—that he had lost two brothers by it. The one had fallen and bitten his tongue, and the other had hurt his great toe; both sunk under the hemorrhage, which was the consequence of these accidents, and which could never be properly arrested. The swelling in this case subsided under the use of discutient lotions; but another appeared on the arm, and one likewise in the calf of the leg. These also slowly disappeared; and a similar deposit took place in the groin, for which he still remains in the Infirmary. These swellings arising so suddenly, and without any evident cause, could only be the result of effusion; but what produced this effusion it is not so easy to determine. Viewed, however, in conjunction with the family tendency to hemorrhage, the case is possessed of considerable interest.

Ere concluding this Report, it may not be uninteresting to state a few facts respecting the total number of patients that have come under my care, in my public capacity, as physician to the Dispensary and Infirmary.

I may premise, that the woollen manufacture is the chief occupation of this Beehive of Yorkshire. Its different processes are not generally inimical to health; and, I believe, the persons employed in them will bear a favourable comparison as to their physical condition with any in-door work-people in this or any other densely populated district.

Could I give as good an opinion of their moral and intellectual, as of their physical state, it would afford me much gratification. But here, alas! there is much that requires change—much that calls loudly for improvement. Here there is an ample field for the wisdom and energy of every lover of his species and of his country. I find that not quite one-half of the applicants at the Infirmary, above eight years of age, are able to read; and a much smaller proportion are capable of writing their own name.

TABLE OF AGE AND SEX.

	Males.	Females.	Total of both sexes.
Under 5 years,	589	551	1140
From 5 to 10,	375	354	729
—— 10 to 20,	660	853	1513
—— 20 to 30,	527	923	1450
—— 30 to 40,	660	1066	1726
—— 40 to 50,	630	930	1560
—— 50 to 60,	411	527	938
—— 60 to 70,	297	328	625
—— 70 to 80,	150	89	239
Above 80, -	14	8	22
	4313	5629	9942

From the preceding table it will be observed, that the aggregate number of females far exceeds that of the males; but the excess does not hold good at every period of life. In the first ten years of existence, the number of each sex is nearly equal—the males rather preponderating—but only in about the ratio that male births exceed the female. From the tenth year, however, until the fiftieth, the females are greatly in excess. After the fiftieth year, the disproportion gradually lessens until the seventieth, when the males again surpass the females. The applicants between the thirtieth and fortieth years do not fall much short of those in the first ten years; but the proportion of the sexes differs materially. In the latter period, as I have already stated, the males slightly preponderate; while in the former, the females are nearly as 10 to 6. Out of the whole number, within a fraction of nine per cent. are upwards of sixty years of age.

With regard to the diseases under which these patients laboured, I regret my inability to give a full enumeration. The sufferers have been almost entirely out-patients; and with such it is very difficult to keep an accurate register of their ailments. When the malady is well-marked, on the case first coming under notice, its designation is generally entered in the hospital journal, with the name, age, and residence of the patient. When, on the contrary, there is any doubt or obscurity as to its nature, this is postponed, and too generally altogether omitted.

Notwithstanding this deficiency, some knowledge of the most prevalent forms of disease in this manufacturing district may, perhaps, be gleaned from the subsequent particulars; and, with respect to some of the more obvious complaints,—such as affections of the skin and eyes, Bronchocele, Epilepsy, *Paralysis, Chorea, Diabetes, Phlegmatia dolens,* and some others,—the statement may be considered complete.

Fever, 465. This includes the remittent or gastro-enteric fever of children, which forms nearly one-half of the whole; and the intermittent fever. Of the latter, there have been only fifteen cases; and all, except one, have occurred in Irish labourers, who had worked at the harvest in the fenny districts.

Thoracic diseases, 454. About 80 of these were *Phthisis*, and 20 *Hemoptysis*. Diseases of the skin, 300,—viz. *Psoriasis*, 106; *Scabies*, 73; *Porrigo*, 54; *Prurigo*, 28; *Lepra*, 15; *Herpes*, 10; *Urticaria*, 8; and a few cases of *Impetigo* and *Lichen*. Rheumatism, 268;—of which by far the greater part were females. Headachs and Vertiginous affections, 264; Dyspepsia, 204; Catarrhal complaints, 192; *Ophthalmia*, 150; *Vermes*, 126—four only were *tænia*; *Diarrhœa*, 95; *Amenorrhœa*, 79—the oldest 22; Dropsy, 77; Bronchocele, 74—the youngest eight years of age, and only four males. Two-thirds of the whole had relations, either ancestral or collateral, affected with the disease; when soft, it was generally removed by iodine; when hard, a seton was the only thing that proved serviceable. *Rubeola*, 71; *Epilepsia*, 69—females 36, males 33, and of all ages, from 7 to 78. One woman had suffered from frequent attacks of the disease for thirty-one years, and yet her faculties were unimpaired. *Scrofula*, 66, principally enlarged glands. Spinal irritation, 63; Scarlet fever, 61; Dysentery, 61; Cholera, 57; *Paralysis*, 52; *Variola*, 46; *Leucorrhœa*, 46; *Menorrhagia*, 44; *Tonsillitis*, 41; Difficult dentition, 38; *Pertussis*, 35; Colic, 35; Hæmorrhoids, 32; Jaundice, 27; *Peritonitis*, 26; *Hypochondriasis*, 24; *Hysteria*, 21; *Chorea*, 17—13 females and four males,—the youngest 7, and the oldest 22; *Rachitis*, 17; *Tabes Mesent.* 17; *Amaurosis*, 17; *Hepatitis*, 15; *Hydrencephalus*, 14; *Neuralgia*, 14; *Erysipelas*, 12; *Parotitis*, 10; *Tracheitis*, 10; *Hæmatemesis*, 8; *Gibbositas*, 6; *Hemeralopia*, 6; *Enteritis*, 6; *Lithiasis*, 6; *Otitis*, 4; *Apoplexy*, 4; *Purpura*, 4; *Phlegmatia dolens*, 4; *Hæmaturia*, 3; *Diabetes*, 3; *Morbus cæruleus*, 2; *Mammæ neuralgia*, 1. This last case is still under treatment; and has hitherto resisted every means of cure.

Art. II.—*Observations on the Abuse of Spirituous Liquors by the European Troops in India; and on the Impolicy of uniformly and indiscriminately issuing Spirit Rations to Soldiers.* By Henry Marshall, Esq. Deputy-Inspector-General of Army Hospitals.

When a European soldier lands in India, he receives a daily allowance of two drams of spirits, generally arrack, forty drams being reckoned to the wine gallon. One of the drams is commonly served out in the morning about six or seven o'clock. This quantity of spirits, swallowed upon an empty stomach, promotes a desire for more, and the day is often spent in devising means of surreptitiously introducing liquor into barracks, or what is generally termed by the men "toddy hunting." Soldiers' wives are frequently very active agents in the smuggling of "hardware" (arrack) into barracks, for the purpose of vending it at an immense profit, and the various means which they adopt to gain their end are not a little remarkable. Tin bottles and bladders concealed under the clothes are frequently employed. They sometimes introduce arrack into barracks for retail by means of dipping their under garments into it. To conceal arrack bottles when a search is suspected, they are "planted" in a privy. So ardent is the desire for arrack in some men that they have purchased the dram of a man who preferred money to spirits after it had been taken into his mouth under the eye of an officer, and swallowed it with avidity. In Ceylon the prime cost of arrack is about sevenpence or eightpence a gallon, and the retail price at the canteens is perhaps not less than five shillings. By the daily custom of imbibing spirituous potations, a new want is created, intemperance is established as a habit, and frequent intoxication is the consequence. The wretched drunkard must now have a large supply of liquor in the morning, to recover him from the effects of the quantity drunk the preceding evening. He, perhaps, has neither money nor credit; and his clothes are then sold at a small portion of their value. Some do not stop here; for, after having sold all their own clothes, they will rob their comrades, and with the produce of their dishonesty, provide the means of intoxication. Confinement follows upon confinement,—court-martial upon court-martial,—and punishment upon punishment,—until the worn-out wretch dies in hospital of the "horrors," *(delirium tremens,)* fever, or dysentery; or, if he should for a time resist the fatal effects of disease, his constitution becomes broken down by the combined influence of the poison of spirits, an exhausting climate, and repeated attacks of illness; so that in a few years he is found unfit for further service in India, and is sent home to be invalided. Death is the last, but perhaps not the worst, result of intemperance.

It is impossible to convey a true picture of the disgusting scenes which took place in a barrack-room in India, upon a balance-day, when the men's balances were paid monthly. The evil may perhaps be somewhat abated since the balances were paid daily. Commanding officers were obliged to dispense with parades, sometimes for several days. Occasionally it was with difficulty that the requisite number of men could be found sufficiently sober to be able to mount guard. Even as early as daybreak, the period for mounting guard in India, the men were often found intoxicated. According to accounts which I cannot doubt, the men sometimes drank from fifteen to twenty drams of arrack in one day. I have known a man drink twenty-two drams (rather more than half a gallon) of arrack during the day he was upon guard, without his being considered too drunk for duty. The late sergeant-major of the — regiment had the character of occasionally drinking a gallon of spirits in one day, without being thereby rendered unfit for his vocation. A balance-day had invariably the effect of filling the guard-room, the *Congée House*,* and of adding greatly to the number of sick in hospital.

This description of the life of a British soldier in India is by no means highly coloured. But the evil does not fall only on the heads of the unfortunate sufferers. Military discipline, in all its branches, becomes deeply affected by habits of intemperance. To the generally prevailing vice of drinking are to be attributed almost every misdemeanour and crime committed by British soldiers in India. The catalogue of these, unhappily, is not a scanty one; for, by rapid steps, first from petty, and then more serious, neglects and inattentions, slovenliness at, and absence from, parades, follow disobedience of orders, riots and quarrels in barracks, absence from guards and other duties, affrays with the natives, theft, and selling of their own and their comrades' necessaries, robberies, abusive language and violence to non-commissioned officers, insolence to officers, and last of all, desertion, mutiny, and murder may be traced to this source.

This frightful picture is not exaggerated. I have seen thirty-two punished men in a regimental hospital at one time. Perhaps not a single individual of that number suffered for a crime which was not a direct or indirect consequence of the immoderate use of spirits. I recollect attending at the punishment of seven men of the same regiment, who received among them 4200 lashes. They had been all tried for crimes arising from habits of intemperance. During the infliction of the punishment not a man uttered a word of complaint; and when each individual had received the amount of his sentence, he tossed his shirt over his left shoulder with an air of triumph, and strutted out of the square, seemingly much gratified with his own fortitude, and apparently conscious that he had risen higher in the estimation of his comrades. It is hardly necessary to observe, that this means of preventing inebriety and its consequences was completely nugatory;—nay, it did harm. The feeling of degradation after corporal punishment by soldiers for crimes which are not deemed disgraceful by their comrades is much less general and less intense than is commonly supposed by civilians. Bad men frequently continue to be bad men in spite of punishment,—they are not so often made bad by it as is alleged. I shall transcribe an extract from the letter of a friend who was for a number of years adjutant to his Majesty's —— regiment, on the Madras Establishment. "The first balance-day I witnessed in India surprised me greatly. The company to which I belonged was about seventy strong; and of that number, perhaps there were not ten men perfectly sober at evening parade. Many men were so drunk that they could not stand, far less walk. On the succeeding day, they were in a similar state of intoxication. Thus for years did I witness such scenes of inebriety and consequent profligacy. Drunkenness is the precursor of nearly all the crimes for which men are punished in India. The more common of these crimes are drunk for duty, drunk on duty, sleeping on sentry, selling necessaries, pilfering the property of others, insolence and violent conduct towards non-commissioned officers and officers, mutiny, and murder. Corporal punishment, solitary confinement, appending logs to the feet, and heavy drills, were all much employed as means of checking the prevalence of crime, but crimes did not become less frequent, or less heinous. I recollect a very fine young lad who joined the corps a recruit. He had been carefully educated; his manners were good; his conduct correct; and for some time he resisted the contagion of bad example. The influence of good principles eventually, however, lost its power. From being disgusted and horrified with the conduct of his comrades, he first felt indifference at it, and then he began to emulate their profligacy. Occasionally, however, he seemed to have some compunctious impressions. He at last one day, seemingly maddened by remorse, and excited by arrack, struck the captain of the company to which he belonged. He was tried by a court-martial, and sentenced to suffer death. This man's history brings to my recollection the fate of another devoted wretch. One morning he rose at day-break, when the bugle sounded to assemble for exercise. Without knowing why, he lingered behind his comrades, and at last his eye chanced to fall upon a poor native girl who was fast asleep in the barrack-room. He deliberately (if any act of a half-besotted drunkard can be called deliberate) loaded his musket, and blew out her brains. Scarcely had this horrid circumstance taken place, when he was deeply impressed with remorse, and horrified at his own conduct. The girl, he admitted, had never done anything to offend him, and, indeed, he knew nothing of her."

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* A place of confinement for the reception of defaulters, and so named from their diet being bread and water, or rice-water, in India called *Congée*. In this country, the place of confinement for defaulters is known among the soldiers by the name of the "dry room;" perhaps from the circumstance, that men who are confined in the defaulters' room are not permitted to get spirituous liquors.

The following extracts, from General Orders issued in India, will, if possible, show the extreme prevalence of inebriety among European troops in that country, and its evil consequences, in a still stronger light.

Extract from General Orders, issued by Lieut.-General Sir George Nugent, bearing date Calcutta, 11th August 1813, upon the occasion of confirming the sentence of a court-martial, which had tried a soldier " for having presented and snapped a pistol at quarter-master C——h, being in the execution of his duty." The sentence was " To be shot to death."

" The commander-in-chief deems it necessary to advert to the circumstances under which the prisoner is stated to have laboured when he meditated the heinous and flagrant act for which he is about to forfeit life.

" Drunkenness, a propensity so detestable in itself, so prejudicial to discipline, so disgraceful to the soldier, and so very frequently productive of the most lamentable consequences, has not unusually been advanced, as in the present instance, in palliation of an offence committed under its degrading influence; but it ought never to be absent from the recollection of the soldier, that drunkenness constitutes of itself a breach of military discipline, which cannot be too strictly watched, or too promptly checked in its infancy, for it eventually leads to almost every censurable act of which the soldier is guilty. When, then, it is associated with the commission of another crime, it becomes proportionably aggravating, and can never be received in extenuation of any such offence.

" The commander-in-chief in India, therefore, avails himself of this occasion to claim the assiduous and persevering exertions of officers in command of regiments, and all those serving under him, in suppressing, in its earliest stage, a propensity of so evil and pernicious a tendency as drunkenness,—a vice which never fails to prove detrimental to the reputation and best interest of every corps in which it unhappily prevails."

Extract from General Orders, issued by Lieutenant-General Sir Thomas Hislop, bearing date, Madras, 26th October 1818, upon the occasion of confirming the sentence of a court-martial, which had tried a man for snapping a pistol loaded with powder and ball against a sergeant. The sentence was, " To be shot to death by musquetry."

" In the defence set up by the prisoner, he has pleaded intoxication in mitigation of his guilt, as if one crime, instead of aggravating, could privilege the commission of another. Lieutenant-General Sir T. Hislop cannot too strongly deprecate this shallow argument, for experience has demonstrated that drunkenness is the prolific source of almost every crime that is committed by the soldiery in this country. Since the institution of the recorders and supreme courts at Madras, no less than thirty-four British soldiers have forfeited their lives for murders, and most of them were committed in their intoxicated moments.

"The lieutenant-general has dwelt on this crime, in order to bring the subject home to the reflection of the European soldiery serving under this presidency. His Excellency most earnestly exhorts them to abstain from the use of these poisonous liquors, which do but enervate their frames, deprive them of reason, and lead them to the commission of crimes the most disgraceful and abhorrent."

In another general order he strongly animadverts upon the fatal effects of drunkenness,—"a crime which has hitherto been disgracefully prevalent in this army, and to which so many soldiers owe the disgrace of public punishment, and the loss of health as well as character."

Extract from General Orders, issued by Lieutenant-General the Honourable Sir Charles Colville, bearing date Bombay, 26th July 1820, upon the occasion of his confirming the sentence of a court martial which had tried a soldier for presenting a loaded firelock, and snapping it at Sergeant W. G——. The sentence was, "To suffer solitary imprisonment for a period of twelve calendar months."

"His Excellency will not conceal his disappointment, and even regret, after the perusal of the proceedings on the trial of J. Jones of —— regiment; that this offence had not been met by capital punishment, so much does example of the kind seem wanting to a numerous class, who, in their devotion to spirituous liquor, forget every other consideration for themselves or their neighbours, disgrace the religion and country they belong to, and bid defiance to the laws of the king and government which they are sworn to obey, and whose bread they eat."

These considerations present not only the correct view of the influence of intoxication on the culpability of persons who commit crimes, but are in strict accordance with the sound principles of moral law, and also of the laws of this country. Blackstone justly observes, that the law of England looks upon intoxication as an aggravation of an offence, rather than as an excuse, for any criminal behaviour; it will not suffer any man to privilege one crime by another. It is, nevertheless, I must observe, a very great inconsistency in any government to sanction, by public and express authority, the application of the very cause which, directly or indirectly, occasions these criminal acts. While, on the one hand, it furnishes the soldier with the means of producing a temporary deprivation of reason and obliteration of the moral sense, sufficient to make him perpetrate the most atrocious crimes, it, on the other, punishes with just and merited severity the acts committed under the influence of the very agent which it has been the means of furnishing. How, I may ask, can commanding officers and courts-martial totally reject the excuse of intemperance, so long as a soldier is furnished by government with the means of depriving him of his reason as part of his daily subsistence, all of which he is directed to use? Beccaria is of opinion, "That the punishment of a crime cannot be just (that is necessary,) if the laws have not endeavoured to prevent that crime by the best means which times and circumstances would allow."

It may, I think, be useful to disabuse the public authorities in India in regard to several erroneous opinions which some of them seem to entertain.

The first error with respect to the use of ardent spirits which I mean to oppose, is, that they contribute to enable men to undergo great fatigue.

This is, I believe, a very common error. Spirits never add permanent strength to any person. In all climates the temperate livers are the fittest to endure fatigue. Dr Jackson travelled 118 miles in Jamaica in four days, and carried baggage equal in weight to the common knapsack of a soldier. He says, "In the journey which I have just now mentioned, I probably owe my escape from sickness to temperance and spare diet. I breakfasted on tea about ten in the morning, and made a meal of bread and sallad after I had taken up my lodging for the night. If I had occasion to drink through the day, water or lemonade was my beverage." He concludes his observations on this topic by stating, "I have introduced my own experience on the present occasion, because it enables me to speak from conviction, that an English soldier may be rendered capable of going through the severest military service in the West Indies, and that temperance will be one of the best means of enabling him to perform his duty with safety and effect." Personal experience has taught me that the use of ardent spirits is not necessary to enable a European to undergo the fatigue of marching in a climate whose mean temperature is between 73° and 80°, as I have often marched on foot, and been employed in the operations of the field, with troops in such a climate, without any other beverage than water and coffee. So far from being calculated to assist the human body in enduring fatigue, I have always found that the strongest liquors were the most enervating, and this in whatever quantity they were consumed; for the daily use of spirits is an evil habit which retains its pernicious character through all its gradations. Indulged in at all, it can produce nothing better than a more diluted or mitigated degree of mischief.

2*d*, Another error prevails in regard to spirituous liquors, namely, that they prevent the influence of the cause of endemic fever in tropical climates.

This is a false and a dangerous opinion. Where endemic fever prevails, the temperate, it is true, are attacked as well as the intemperate, but it is universally admitted by medical men that the former has a much better prospect of recovery than the latter. Desgenettes, in his Medical History of the French Army in Egypt, observes, that "daily experience demonstrates, that almost all the soldiers who indulge in intemperate habits, and that are attacked with fevers die; nay, we may go still farther and say, that they have been more liable to an attack of disease." The use of spirits even in a moderate quantity has a powerful tendency to aggravate the violence, and to increase the danger of the diseases of warm climates. Strong liquors have certainly no legitimate claim to be considered as a means of preventing disease. I am aware that medical officers have sometimes recommended a portion of the daily ration of spirits to be issued early in the morning, commonly, however, as a measure of expediency or necessity rather than of choice. Soldiers attribute a very deleterious quality to morning fogs, and allege that spirituous liquors prevent their bad consequences. Many of the officers entertain, or profess to entertain, a similar opinion. By this means false views are maintained and propagated in regard to the effects of spirituous liquors. The medical officer, acquiesces in the propriety of the morning issue of spirits frequently from another cause, namely, that when men who have been intoxicated the preceding evening appear at parade, or are taken-out for drill in the morning, they are apt to become faint and sick, unless the stimulus be renewed. Mr Annesley, after twenty years' service in India, has come to the following conclusion on the subject: "From the nature of the predisposing and exciting cause of disease in India, and the habits and constitutions of recruits newly arrived, the extreme impropriety of teaching the young soldier to drink a certain quantity of ardent spirits upon an empty stomach every morning needs no comment, and it is served out to the youngest drummer, perhaps not more than fifteen years of age, in the same proportion as to the oldest soldier. We would suggest that the drams should be served out to the men in the cool of the evening, instead of the morning, *if they be served out at all.*"

"*This dram-drinking is the source of much mischief. The habit thereby occasioned destroys more lives in India than climate or the sword.*"

3d, An opinion, that the bad effects of an inordinate use of spirituous liquors depend chiefly upon an alleged adventitious deleterious quality of the spirits employed.

When we meet in general or regimental orders (which is by no means uncommon) with such expressions as "good drink,' "wholesome liquor," &c. it is evident that the habitual use of spirituous liquors is not in itself generally regarded as having any very injurious effect on the human constitution. The evil consequences of intemperance are apparently attributed to the use of "bad spirit," "pariah arrack," &c. only. This is a dangerous delusion. The man who has been long accustomed to take regularly a considerable quantity of "wholesome arrack," even although it be alleged that there is not "a headach in a gallon of it," is subject to all the consequences of intemperance, and should he escape falling a victim to the "wholesome arrack," or the "pure liquor," he will eventually come to relish "Hell's-blazes;"[*] or any other liquor which "bites the roof of the mouth and toxicates." A soldier does not commonly prefer "pariah arrack" to "good drink" on account of its quality, but because he is able to purchase a greater quantity for the same money. He gets into the delirium of intoxication at less expence, and as his pay is limited, he is the better able to maintain himself in that state. But "wholesome arrack" paves the way to the use of the "deleterious compounds," so that a daily use of the best spirits should not be considered an innocent practice. When the persons who smoke opium and bang in India have neither of these drugs, nor money to purchase them, I have known them boil the smoking apparatus, which is made of a Bamboo, in a little water, and drink the decoction. The ingenuity which people occasionally exercise in inventing excuses for their own evil habits, and sometimes for the evil habits of others, is truly surprising. I recollect an officer, a patient of mine, who, while suffering from *paraplegia*, or palsy of the lower half of the body, in consequence of intemperance, used to congratulate himself in the following terms: "Well, although

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[*] This is the barrack-room denomination of a mixture composed of arrack, fermenting toddy, and Cayenne pepper. In Ceylon, "Hell's-blazes" is prepared by boiling the heads of Cayenne pepper in arrack, which is drunk while still warm.

I have been accustomed to take a glass too much, thank God I have never been in the habit of drinking common arrack, that would soon have finished me. I have always stuck to the rum." He seemed to think that he was less culpable in yielding to the seductive charms of rum than he would have been had he drunk arrack, and, after all, the rum he drank was only coloured arrack.

Some qualities of spirits may be more deleterious than others; but I am disposed to think that the extensive demoralizing and poisonous influence of spirit-drinking in the army on foreign stations is to be attributed much more to the quantity swallowed than to any peculiar quality of the liquor, and to this circumstance should the care of commanding officers be directed. In the West Indies, new rum is supposed to be extremely hurtful to the human constitution. It ought, however, to be recollected that the liquor usually designated "old and good," found in the barrack canteens, is sold at the rate of about a shilling a bottle, while that which is vended outside the barrack wall may be purchased at threepence a bottle. The consequences of this circumstance are obvious: if a soldier fail in obtaining leave to go out of barracks to procure a large quantity of spirits for a little money, he will, by the exercise of his ingenuity, get it introduced to him. The mixture denominated "kill devil," which consists of rum of any quality, new or old, syrup, eggs, and a small portion of water, owes its poisonous effects to the quantity of spirits of which it is composed. The strength of the composition is concealed by the syrup which is employed, and by this means a large quantity of rum is swallowed. "Kill devil" is supposed to occasion that extraordinary distortion of the fingers usually denominated "crab clawed."

4th, That dilution has an important influence in obviating the pernicious effects of spirits.

In 1809, a general order was issued in Bengal, of which the following is an extract. "The commander-in-chief recommends the liquor which may be served to the troops on occasions of extra batta, to be mixed with such a proportion of water as may obviate the pernicious effects arising from the use of unmixed spirits." When the commander-in-chief supposed that he could by this means prevent the pernicious effects arising from the use of unmixed spirits, it is greatly to be regretted that he limited his diluting system to extra wet batta, and did not extend it to all the rations of spirits issued to the men. To make spirits into two or three water grog renders accumulation inconvenient, and the dram less marketable. This is nearly the extent of the advantages of dilution. Who that ever gave the subject one moment's consideration would conceive that a mixture composed of one proportion of spirits and two of water has no "pernicious effects." It is perhaps not improbable, that, when a large proportion of water is added to spirits, a less quantity of the intoxicating liquor is swallowed, and hence the pernicious effects are not so strongly marked. The most inveterate drunkards, however, let me observe, seldom drink unmixed spirits; they, I believe, generally dilute largely, yet who will say that by this means they escape the consequences of intemperance?

The evil tendency of issuing spirits to soldiers as a part of their daily subsistence, is, I believe, very generally admitted by medical officers of the army. In regard to this subject I will transcribe a paragraph from the work of Dr Jackson, "On the Formation and Discipline of Armies,"—an author who devoted more attention to the means of preserving the health of soldiers, and of rendering them efficient, than perhaps any medical officer ever did. "Water is the direct remedy which the Author of Nature has provided for quenching the thirst of man and beast. Where good of its kind it is a wholesome beverage; it is the most common, the most convenient, consequently the best drink for soldiers. Beer cannot be produced for armies at all times and in all places; and, as this is the case, it is fit that a soldier be accustomed to the drink which he has the best chance of always commanding. If water be muddy, the addition of a small quantity of alum makes it clear; if flat and mawkish, the addition of vinegar rectifies the imperfection, rendering it pleasant to the taste, and wholesome to the habit. This was the practice with the Romans. The moderns, wishing to improve, have substituted rum or brandy in the place of vinegar; and among these, the British nation, meaning well, but wanting in knowledge, has voted a daily ration of rum for the use of troops in foreign service. The original cause was ostensibly a pretext of bad water: the effect continues where the water is as good as any water in the world. A practice so originating, continued without discrimination of necessity or usefulness, has been productive of evil morally, and physically it has served to cut short the life of multitudes. The ration of rum granted as a bounty, and for an ostensible purpose, is now regarded as a right, and claimed without a cause of usefulness. The young soldier receives his allowance, and consumes it in many cases, not because he likes the rum, or that he thinks it useful for his health, but because he considers it to be his own. Soldiers are tenacious of their own; and this spirit of tenaciousness has the effect to convert a soldier to a lover of rum—frequently to a drunkard—and, as years advance, into a sot, for the habit grows with years. The love of liquor undermines the foundations of military qualities, and even tarnishes the lustre of the moral virtues. It impairs bodily health and mental energy. When a soldier is under the influence of liquor he is insubordinate to command; intoxicated beyond a certain measure, he is incapable of meeting an enemy in the field. He may present himself to be killed; for, as he has no use of his reasoning faculties, he has no fears; but he is useless as a soldier, for he has no appreciable powers of offence or defence. Hence the evils of the bounty in question are obvious. The bad effects are experienced; but it requires courage to propose a remedy, and an example of superior virtue and energy to carry a measure of reform into execution. It is at all times difficult to eradicate bad habits,—it is a delicate task to impose a law of retrenchment where depraved appetite is concerned,—but it is necessary in the present case, if it be desirable to preserve the health of the soldier, and the virtue of the man, which is even of more importance than the health."

There is something very absurd in the indiscriminate issue of spirit rations to Europeans in India. To prevent men who may value money more than arrack from hoarding their allowance and disposing of it to others, it is customary to make every soldier drink his dram, or to throw it away. This measure may have some influence in retarding the extinguishment of life in a few individuals, but it cannot fail to corrupt the habits of all. In many regiments the orderly officer is obliged to certify that he witnessed every man drink his drams "at the tub." We instil the moral and physical poison with one hand, and hold out the lash as the antidote against indulgence with the other. Coercive measures are very ineffectual for preventing the evils arising from intemperate habits, partly because soldiers do not generally regard drunkenness an ignominious vice. When punishment has no influence in checking a man from repeating a breach of discipline, or in preventing others from committing a like offence, it is worse than useless. The habit of indulgence in spirituous liquors is obstinately hugged by its victim. "Persons," says Dr Rush, "who are inordinately devoted to the use of ardent spirits, are irreclaimable by all the considerations which domestic obligations, friendship, reputation, property, and sometimes even by those which religion and love of life can suggest to them. An habitual drunkard, when strongly urged by one of his friends to leave off drinking, said, 'Were a keg of rum in one corner of a room, and were a cannon constantly discharging ball between me and it, I would not refrain from passing before that cannon in order to get at the rum.'" Distant paroxysms even of absolute inebriety are infinitely less hurtful to the health, efficiency, and habits of soldiers, than the custom of daily imbibing what some may consider a moderate allowance of spirits. Regularity establishes a habit; and experience tells us, that, to establish a habit of drinking spirits among soldiers, is to destroy their health, and to ruin the discipline of a corps. An equal quantity of spirits drank surreptitiously would have a less hurtful effect than when issued in the form of rations. Often when a non-commissioned officer challenges a soldier with being drunk, the man will reply by saying, "No, I am not drunk,—I have only drunk my drams, and that you know is my own, and was given to me. Put me through my facings if you please." So long as spirit rations are issued to Europeans in India as part of their daily subsistence, we can never effectually check the vice of drinking to excess—Indeed it can hardly be attempted with any show of consistency. The soldiers are occasionally allowed extra wet batta, (a double allowance of spirits,) so that they are in a manner bribed to perform certain duties, by the most destructive of all measures, namely, by ministering to their evil habits.

The obvious purport of these observations is to recommend an abolition of the indiscriminate and uniform issue of spirit rations to European troops in India, with the view of abating the extent of crime, lessening the proportion of sick, reducing the ratio of mortality, diminishing the number of men discharged on account of disabilities, and of promoting the welfare, efficiency, and discipline of corps.

In the management of soldiers in India, there are two problems of much importance, neither of which has obtained all the attention and consideration which it deserves, namely,

1. How should commanding officers direct a soldier's pay to be expended so as to promote his comfort and efficiency, and to deprive him as much as possible of the means of injuring his health, and deteriorating his morals?
2. What means should be adopted to induce soldiers to employ their spare time usefully or innocently?

Until 1830, wine or spirit rations were issued to soldiers indiscriminately on board ship, and in all foreign stations under the immediate control of the British government, as part of their regular diet, and Sir Henry Hardinge has the merit of perceiving and appreciating the evils of the practice, and of abolishing the abuse. During the time he was Secretary at War, a "warrant regulating the issue of provisions to the troops on foreign service, bearing date 22d July 1830," was promulgated, which contained the following article.

"Instead of the allowance of wine or spirit hitherto granted, as a component part of the daily ration of provisions, an equivalent in money, calculated at a penny *per diem*, and to be styled *liquor money*, shall in future be given on all foreign stations, where rations of provisions are issued under the authority and scale of this warrant.

"As, however, in cases of active operations in the field, the officer in command of the forces may find it indispensably necessary to supply them with the articles in kind, such officers shall have the discretionary power of discontinuing this allowance in money, and of substituting for it a ration of wine, spirits, or any other article of subsistence; and the officer commanding any regiment, troop, company or detachment, shall, at his own discretion, when engaged in operations in the field, or employed on board transports, suspend, diminish, or wholly take away the liquor ration when issued in kind, in case of the misconduct of any soldier or officer's servant.

"If, at any station abroad, local or temporary circumstances should render it at any time adviseable, either owing to the remote situation of the post or station, or for the health of the troops, to substitute wine or spirits in lieu of the penny a-day, the officers in command of the station shall, in the exercise of his discretion, authorize the same, and in the latter case, or on report made by a board of medical officers assembled by his orders, having, if the case admits of the reference previously obtained, the sanction of the superior officer of the command, reporting the same for the approval of the Lords Commissioners of the Treasury."

This measure has worked extremely well, and it promises to be highly beneficial, especially in regard to recruits or young soldiers who have not already been corrupted by the influence of the former system. The gratitude of the army and the country is most justly due to Sir Henry Hardinge, for abolishing an improvident law which, however well intended, has been followed by most deleterious results. As Dr Jackson observes, although the bad effects were obvious, and universally admitted, it required courage to propose a remedy, and an example of superior virtue and energy to carry so important a measure of reform into execution. The plan adopted for this purpose was highly judicious, and it has been completely successful.

ART. III.—*Observations on Epidemic Gastric Fever, as it appeared in Limerick Garrison during the months of May, June, and July* 1833. By RICHARD POOLE, Esq. Assistant-Surgeon 32d Regiment.

AFFECTIONS of the alimentary canal were the prevailing disorders in the 32d Reserve, during the period of its being quartered in Limerick; but it was not until the subsidence of the influenza, that any examples of gastric fever made their appearance. Before this, one or two sporadic cases of an inflammatory type had occurred; but in these no decided evidence of gastro-enteric character existed. Besides, as the treatment, apparently the best adapted for these, would have had less beneficial effects in the complication mentioned, it is but fair to infer, that the alimentary canal was not the seat of any lesion that could have influenced their character; and it is singular, too, that, even during the time cholera existed in the garrison, some fevers, without any gastric complication, made their appearance.

Be it remarked, then, it was not until the influenza had existed for some time, and was on the decline, that a change in the type of the fever was observable; and that it is from this period I date the commencement of the epidemic which it will be my task in the following pages to describe.

It is not necessary for me to mention here the frequent instances on record of gastro-enteric fever, and diseases following the march of this singular affection. They are well known to most of the older practitioners who have paid any attention to epidemic constitution, and are amply detailed in the article Influenza published in the Cyclopædia of Medicine, to which I refer. It is equally unnecessary for me to give the *rationale* of their connection. This must strike any one who considers the similarity of the textures concerned, especially as, of late, attention has been much paid to the sympathies existing between the two membranes, and to the facility with which disease in the one is extended to the other. The article on Epidemic Gastric Fever by Dr Cheyne, in the work alluded to, is a valuable summary of most of the facts connected with the disease; and nothing would induce me to go over nearly the same ground, but the wish to adduce farther testimony to the truths it contains,—and some anxiety to impress upon the attention of my professional brethren in this country, the necessity of admitting the existence of a class of diseases which requires a plan of treatment very different from any promulgated by the authorities on whom they have been long in the habit of placing exclusive reliance.

That the disease in question depends upon a lesion of the gastro-enteric mucous surface, I conceive to be as probable as the connection between *pneumonia* and its symptomatic fever; and, although I cannot bring forward necroscopic appearances to elucidate the position,—none of the cases having proved fatal, —I consider the relative proofs so strong, that I do not hesitate in giving to the disease the name here fixed,—believing that, under this, it is deserving of a place in any system of nosology founded on a pathological basis. Its similarity to the disease described by Dr Cheyne, who gives several dissections, is farther evidence of the correctness of this view.

Most of the cases which came under my observation presented, before the disease was unequivocally developed, considerable general disturbance, but by no means of a nature to excite apprehension of its invariable results,—being confined in a great measure to lassitude and prostration,—the patients complaining of general uneasiness, without being able to point out one sensation more uncomfortable than another. They were heavy, dull, and listless,—hanging over the fire,—feeling chilliness at one time, and irregular distribution of heat afterwards, with loathing of food, and frequent inclination for cold drinks, from the dry and parched state of the mouth. This was generally greatest in the morning. The complexion was usually dusky, all trace of sanguination being gone from the cheeks, and often the lips. These disagreeable symptoms lasted for several days, and were soon followed by the developement of fever, which was most complete towards night. The pulse averaged at 110; was sometimes tense, but generally soft and full. The skin became remarkably dry and harsh; moisture was never observed on it; and, in some cases, it assumed a degree of roughness similar to what is observed in chronic affections of the gastro-enteric organs. The patients became more and more depressed, and were overpowered by an apathy to external objects or ordinary impressions; and, though even now they scarcely complained, except, perhaps, of weakness, the whole expression showed amply the extent to which the disease had overcome their energies. As the fever may be now reckoned at its height, it will be better, for the purpose of elucidating its nature, to take a view *seriatim* of the symptoms, as referable to their respective localities.

I think it will be proved, in the course of this memoir, that the symptoms which might be termed cerebral were merely functional or sympathetic; but, to make the history as complete as possible, I shall mention, in the first place, all of them that may be attributed to an irritation of the *sensorium*. The most remarkable of these was profound torpor. The patient lay without exhibiting any evidence of intellect remaining,—the eyes were closed, and only sluggishly opened when he was addressed,—a few incoherent words were uttered at first, and as it were at random,—but presently he became roused, and answered questions as distinctly as the dry state of the mouth would permit. There was now complete return of consciousness, and the patient described with correctness his situation and feelings. In one case only, a man of the 83d Regiment, was there total insensibility, with picking the bed-clothes. Some complained of confusion in the head, giddiness when it was raised from the pillow, with noise and buzzing in the ears. Deafness was also observed. In one, twitching of the lips and slight contortion of the mouth were detected; but these, I think, were almost entirely occasioned by the intense dryness of the fauces. Pain in the head was seldom complained of, and certainly was not felt at all by many, while giddiness and beating were often mentioned. The eyes were never injected, but dull and heavy; the cheeks seldom flushed,—the complexion being generally of an earthy-yellow cast.

All these symptoms, I am induced to believe, were entirely due to sympathetic excitement, and in no case appeared to depend on structural lesion. They become worthy of some special consideration, with a view to tracing their dependence on derangement existing in another situation. To this, however, I shall refer in its proper place.

The chest, examined by the stethoscope, afforded in every case, during the pyrectic stage, numerous sibilant and sonorous rattles; but I generally found these disappear, without being followed by others, or any symptoms of bronchial disease. In some cases, however, they were attended by cough and expectoration, but never with pain; and in several I found benefit result from treating this affection locally,—a fact which I might readily have overlooked, but for the stethoscopic observation.

From these circumstances, and many others which I need not detail here, I think the stethoscopic signs deserving of attention, in showing the intensity of the disease when taken along with the symptoms; but I safely can state, that I usually considered the former of little importance, when not accompanied by other evidence of disease, and that I never had cause to regret having done so. Laennec probably carried his views on this point too far, and I hold the profession indebted to Dr Graves for having sometime ago drawn their attention to the subject, and shown the errors into which we may fall by placing too much reliance on the signs furnished by auscultation during the progress of certain fevers.

But to proceed. The pectoral symptoms, when they did appear, were never serious. Some cough, with varied expectoration, might occur in the morning; but there never was anything like profuse secretion from the bronchial membrane, and in none of the cases did the *parenchyma* or its investments suffer.

A *gastro-enteritis* being, so far as I can determine, the immediate cause of the phenomena observable in this disease, the symptoms ascribable to the disordered *viscera* demand the greatest attention. Yet with all this, an observer might overlook the seat of the whole mischief, and be led to consider a disease essentially specific, and requiring a distinct plan of treatment, as either of no importance, or similar to others which he is daily in the habit of meeting. A most mischievous and absurd blunder about pain at *epigastrium*, red tongue, &c. as characterising gastric complication in different diseases, has been of late freely promulgated; and one is almost tempted to understand, that inflammatory affections of the muco-enteric surface have been specially favoured in being made so palpable to our powers of discrimination. But, however *decided* ignorance may be in its dogmas, any one who has paid attention to the diseases in question cannot but state, that their symptoms are far from being so glaring, and, from out the innumerable variety exhibited, will fail in pointing out any one or two as pathognomonic. In none of the numerous disorders produced by this lesion are the symptoms so varied and obscure as in the one before us; and it is only from their assemblage, and not from any in particular, that a diagnosis can be made. For example, in not one of the cases did there exist tenderness at the *epigastrium*, or any other part of the abdomen. Pain and weight, indeed, were often felt, but they were by no means constant, and depended most frequently either on distension from wind, or the soreness that attends a loose state of bowels.

Diarrhœa invariably ushered in the complaint, and frequently reappeared during its course; but the bowels were at other times slow, and required to be unloaded. Every medicine in this way, however, required to be of the mildest nature, as even the gentlest laxative produced often violent effects. The fecal discharges were varied;—in some they appeared wholly serous or mucous; in others natural, but liquid. Various intermixtures of colouring matter were frequent;—in some blood; in others bile; and, in a case of the 83d Regiment, what might be termed mælena. In this case, large quantities of calomel and Cayenne pepper had been given by a practitioner in the country, who, fortunately for the patient, considered his case bad enough to have him removed to head quarters. Griping was a frequent attendant, but *tenesmus* was not observed. Vomiting of *bilious*-looking matter occurred in one case; but the stomach was generally retentive, though nausea was by no means unfrequent. Complete *anorexia* existed for many days. The patients obstinately refused to eat any thing,—appearing to loathe the sight of food, or the idea of using it.

Thirst was incessant, cold drinks being greedily asked for, and relished; whereas anything warm was as much an object of aversion as food. The mouth for many days was dried up, and parched to a remarkable degree; the fauces, gums, and tongue were red and glazed, as if covered with gold-beater's skin;

the latter, during the course of the fever, became hard, dry and chopped, enveloped with a firm dark brown or black fur, and bleeding from its numerous fissures, when protruded from the mouth, which was done often, only with difficulty. This state of the tongue was very constant, and lasted until the fever was on the decline. The dryness of the fauces, as I mentioned before, was the cause of the deficient power of enunciating which existed in all the cases. I was led at first, however, to look upon it in another and more serious light.

To the state of the stomach and bowels must also be referred the constant prostration and feeling of languor and helplessness which characterized the attack; and I cannot but believe, that the torpor observed in many was but a high degree of this feature. The value of determining the point can only be appreciated by taking into consideration the readiness with which it may be confounded with *coma*, and attributed to structural derangement of the brain or its membranes. In two of the cases, in which it was most evident, a man of my own corps, and one of the 83d Regiment, in which it was attended with involuntary discharge of feces, total insensibility, picking the bed-clothes, and other ataxic symptoms, it was entirely removed by copious leeching of the abdomen, and cold drinks,—with small doses of *Acet. Morph.* in the latter case; in which, had it been occasioned by sensorial lesion, it would surely have been increased by the opiate. In the former case, the assumed debility and prostration were so intense, that the patient could scarcely turn in bed. Yet, after the second or third leeching, he recovered so much, that, on awaking from sleep, and probably dreaming of other days, he got out of bed, put on his clothes, walked down stairs, and was found at the door of the hospital by the hospital-sergeant, whom he told he was going by my leave to visit his mother in an adjoining county.

These facts, with others which I need not detail here, serve to show that prostration and torpor are but shades of the same disorder; and that, whenever they exist, we are warranted in believing the gastro-enteric surface the seat of more or less inflammatory action. They are, however, by no means new, having been brought before the profession some time ago by M. Broussais, since confirmed by the researches of Andral, and, if less known in this country than they deserve, which I think scarcely admits of a question, it is the fault of a few to whom for long a blind deference has been paid by the mass of practitioners. This, however, is not the place for a discussion of the subject.

The duration of the stage, characterized by the preceding symptoms, varied, of course, in different cases; but, on an average, may be stated to have lasted from a week to ten days. In all of them was observed great tendency to muttering during sleep; and several of the patients got up while asleep, and attempted to leave their wards. The pulse varied but little, either in frequency or force,—being often for days 130, but seldom under 100. In this fever, no critical discharges were ever observed; the symptoms gradually declined in severity; the skin became softer and cooler during the day, but evening accessions were observed for some time afterwards; the tongue got daily more moist,—the dry patches disappearing, and being replaced by a creamy deposit, which I always looked upon as the harbinger of recovery. In some cases, this became dry and scaly, from some fresh irritation; but in some of them it slowly went off, leaving the tongue remarkably white, and as it were firmer and closer, from being decreased in volume. The thirst abating, some appetite was felt; but it was never craving or voracious, and was readily satisfied by light farinaceous diet, which the patient invariably relished more than any other that was offered. The cough generally went off about the same time; the bowels became easy and regular, and seldom required during recovery assistance from medicine. Convalescence was tedious and protracted, but in no case was there any relapse.

The duration of the attack averaged from five weeks to two months. As I stated before, no death occurred in any of the cases that came under my observation, which included a squadron of dragoons, the 32d Reserve, and 83d Regiment; but I was given to understand that the son of an officer belonging to another corps sank under a protracted attack. Some cases of fever of a like character prevailed in town; but I cannot state any thing concerning their progress or termination.

Treatment.—General bleeding was adopted in several cases at the commencement, with a view to cut short the disease by making an impression on the system, and to pave the way for local depletion; but I cannot state that in any it appeared to fulfil the intention. In no case, however, did it seem to do harm, as the quantity abstracted was never great. My conviction is, it might have been safely dispensed with in all, as the *phlegmasiæ* of mucous membranes, and especially of the enteric, appear to be little under the influence of the general circulation, and few of them ever excite any violent action of the heart, which demands the use of this remedy. But for all this, cases often occur in which the general excitation is great, and in these general depletion is undoubtedly required, as the attempt to unload the capillaries must be always futile when the centre of circulation continues over-active. I might digress here to some length, as the subject is an interesting one; but the object of this memoir being merely to describe facts and occurrences, anything like discussion is contraindicated.

Suffice it to say, then, that none of the cases exhibited any great vascular excitement, and that the general bleeding was perhaps used more from speculation than cogent reason. Local depletion was in all of my own cases freely used when the disease was pronounced, and different parts of the abdomen were at times selected for this purpose. When much diarrhœa existed, the position of the lower end of the *ileum* and course of the colon was chosen,—the region of the *duodenum* in one, in which there was much yellowness of the skin and *conjunctivæ*; and in most of them, at one time or another, the *epigastrium*, without being demanded by any of what have been looked upon as specific gastric symptoms. Leeches were always used, as cupping is generally more irksome to the patient, and frequently a less efficacious means of procuring blood. From this remedy the best effects were produced,—in most of the cases a marked improvement following each application. The extent to which it was carried was regulated of course by the demand. In some cases, as of men belonging to other corps, in whom the treatment had been conducted from the beginning on different principles, and who presented the worst symptoms observed in the disease, copious leeching was invariably followed by an almost immediate change for the better, and it was from this period alone that the recovery might be dated. I can therefore safely state, that, on this remedy, I chiefly depended as a means of reducing the local affection, after which the progress of recovery was uninterrupted.

Different counter-irritants were likewise applied to the abdomen, as emetic tartar ointment, any of the ethers, turpentine, &c. the former frequently with good effects in restraining diarrhœa, and the others in relieving the sensations of uneasiness complained of.

Counter-irritation on the chest was freely used during the existence of the pectoral symptoms. Tepid and even cold sponging was plentifully used, and always produced grateful and salutary effects. The loose state of the bowels at the commencement precluded every thing in the form of purgative; but, during the course of the disease, attention was paid to procuring daily evacuations by laxatives or *enemata*. This affection, as Dr Cheyne truly observes, is not a fever that requires anything like a purgative plan of treatment,—all that is demanded being merely the emptying the contents of the canal, which is to be done only by the mildest remedies.

As adjuncts to local bleeding, in allaying the irritation of the membrane, and quieting the different uneasy sensations that occurred, I found many of the sedative medicines beneficial, and, when used with caution and due regard to the condition of the patient, I can safely say, that, even under circumstances which might be accounted as contraindicating their employment, they always appeared to me to be followed by excellent effects. The medicines of this class chiefly used were hyoscyamus or the acetate of morphia. The former, in almost every stage of the disease, produced quietness and relief to the local pain; it in some instances gently moved the bowels, and frequently in full doses produced a quiet night's rest, without being followed by disagreeable sensations next morning. Combined with any of the gum solutions, but especially the tragacanth, it formed an excellent lenitus for allaying the cough, and, even in this form, appeared often to relieve the irritation attending the diarrhœa. The morphia was used in several severe cases in the 83d Regiment, even under the worst of the *cerebral* symptoms, with good effects, and in no instance appeared to increase them. I used it in several cases in the 32d Regiment, and found that it frequently procured good nights without any bad effects; but, in others, observing the tongue in the morning more parched, I was naturally led to substitute for it the hyoscyamus, which never occasioned any change in the secretions. In advanced cases, it answered better, particularly if there was troublesome diarrhœa.

During the whole course of the fever, the patients drank freely of cold acidulated mucilages, which relieved their thirst in a way most grateful to their feelings. During the first week or fortnight, abstinence was both enjoined and voluntary; but, on the return of the appetite, mild farinaceous diet was allowed, and the patients by degrees, as the fever declined, returned to the use of more nourishing food. In some, a little wine or malt liquor was allowed during convalescence; but they were not generally required.

I may conclude by saying, that the treatment adopted, with the exception of the depletory measures, was essentially expectant;—in fact, there were but few symptoms to combat, and I took care, as far as possible, to develope no new ones,—a care, in which, as there never appeared any of those alarming and sudden phenomena so peculiarly observed under different circumstances, I have some cause to believe I succeeded.

Art. IV.—*On the Motions of the Pupil.* By Thomas Wharton Jones, Esq. Surgeon.

> "Il y a certainement quelque chose à decouvrir encore sur le méchanisme par lequel se meut la pupille."—*Adelon.*
>
> "Farther inquiry is undoubtedly necessary."—*Lawrence.*

The opening in the iris called the *pupil* is subject to contraction and dilatation for the purpose of regulating the quantity of light admitted into the eye.

When contraction of the pupil takes place, the iris becomes broader in consequence of its pupillary edge moving to a greater distance from its fixed or ciliary margin. When, on the contrary, dilatation of the pupil occurs, the iris becomes narrower, its pupillary edge is elongated, and is drawn towards its fixed or ciliary margin.

Contraction of the pupil is produced by the impression of a strong light on the retina,* or of ordinary light when there is increased sensibility of the latter; whilst weak light, or diminished sensibility of the retina to ordinary light, is the condition under which dilatation of the pupil takes place. In ordinary daylight, when the eye is not particularly employed, the pupil is commonly neither much contracted nor much dilated, but exists in a middle state.

Some physiologists ascribe the motions of the pupil to muscular contraction. They admit a circular muscle around the pupillary edge of the iris for the contraction, and radiating muscular fibres, proceeding from the pupillary towards the ciliary margin of the iris, for the dilatation of the pupil. According to this view of the subject, dilatation of the pupil must be, like contraction, an active state of the iris.

Other physiologists who do not admit muscular fibres in the iris, have supposed that it possesses an erectile structure,—that by an increased afflux of blood into which, the iris is distended, and the pupil in consequence contracted; and that, when the blood retires, the vessels of the iris become empty, and dilatation of the pupil takes place in consequence of the contraction of the iris, by virtue of the elasticity of its tissue,—a property which is essential to all organs having an erectile structure, and subject to sudden dilatation and contraction. This opinion, it will be perceived, tallies with the idea generally entertained, that dilatation of the pupil is a passive state of the iris, and that it is that into which the pupil falls in paralysis of that organ.

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* The motions of the pupil take place subsequent to the impression of light on the retina. It is probable, however, not by its special sensibility, that the retina is affected, but by virtue of that general sensibility which it evidently derives from the fifth pair. On this supposition, those cases of *amaurosis* in which the motions of the pupil still exist may be explained. Thus, although there is such disease of the brain at the origin of the optic nerve as to render the perception of a special impression received by the retina impossible, still the fifth pair may have escaped the influence of the disease, and in consequence the retina will retain its general sensibility, and will therefore continue capable of being affected by the stimulus of light. This, however, is a rare occurrence, because the general sensibility of the retina is so intimately connected with its special sensibility, that in most cases the destruction of the one takes place at the same time as the destruction of the other.

Perhaps belladonna, hyoscyamus, lauro-cerasus, and stramonium, produce dilatation of the pupil, by diminishing for a time the general sensibility of the retina conferred on it by the fifth pair.

But, it may be asked, "Is dilatation of the pupil really a passive state, a state of relaxation of the iris?" To such a question I would answer, "No." On the contrary, I believe that dilatation of the pupil is as much an active state of the iris as contraction of the pupil is, and that the really passive state—the state of relaxation of the iris, is that in which *the pupil is neither much contracted nor much dilated*,—a state in which the pupil is:

In the ordinary day-light, when the eye is not particularly employed;
In simple paralysis of the iris, with sensibility of the retina; and
Some time after death.

This middle state of the pupil is that to which it, by means of an inherent elasticity of the tissue of the iris, always returns after the contracting or dilating force has ceased to act. This tendency of the pupil to return to the medium state after the power which contracts the larger circle of the iris, and consequently dilates the pupil, has ceased to act, is well exemplified by the following experiment.

Lay open an eye by cutting it across, and remove the humours from the anterior segment, which place under water; then introduce the point of a fine forceps with its blades closed into the pupil, and allow the blades slowly to separate—dilatation of the pupil will be by this means produced. If the forceps be now withdrawn, the pupil will be observed slowly to contract, until it resume the medium state in which it was before the experiment.

As to the nature of the structure in which reside the forces by which the iris is moved, I have already shown, that if the motions of the pupil were produced by an erectile structure of the iris, dilatation of the pupil must necessarily be a state of relaxation of that body, which I have demonstrated not to be the case, consequently the motions of the pupil are not produced by an erectile structure of the iris.

Although muscular fibres, such as occur in other parts of the body, cannot be demonstrated in the iris by the aid of the microscope, still circular and radiating fibres may be seen, which bear a considerable resemblance to those of muscle. Whatever the structure may be, I would only observe with regard to its action, that its contractile force need not necessarily be so great as that of muscle, because the iris being suspended in a watery medium, less power is required to move it than if it were suspended in air, in consequence of the resistance of its own weight being thus in a great measure removed.

Art. V.—*Report of Diseases occurring at the Wellesley Dispensary for Lying-in Women and Diseases of Females, during the year* 1832. By Fleetwood Churchill, M. D. Licentiate of the King and Queen's College of Physicians, Dublin; Physician to the Wellesley Lying-in Dispensary, and to the Sick-Poor Institution, Meath Street; Lecturer on Midwifery and Diseases of Women and Children in the Medico-Chirurgical School, Digges Street, Dublin.—*Read at a Meeting of the Surgical Society of Ireland, June* 1, 1833.

The Wellesley Dispensary is open three mornings in the week for an hour and a half, for the reception of any cases of female disease; and patients too ill to attend are visited at their own houses. It is from observations made under these circumstances that the following report has been compiled; and whilst, on the one hand, the field has, confessedly, been very extensive, it may be found on the other, that its extent has diminished somewhat of the minute accuracy desirable.

Again, in estimating the comparative frequency of different diseases, I must candidly confess the scantiness of my materials. Cases which were slight I may, in the hurry of the moment, have omitted to note. This has made me anxious to be rather below than above the actual number of patients in my estimate.

Although I thus admit the possibility of numerical inaccuracy, I am unconscious of any error in the detail of the diseases themselves. I have confined myself to descriptions of the diseases as they were presented to me, and have rarely referred to those of authors. Upon the lowest calculation, not fewer than 500 patients have applied for relief at the dispensary during the past year. If from this number we deduct the ordinary diseases occurring during pregnancy, with those cases of very slight disorder which so constantly annoy females in that situation, we may certainly state 300 as the number of diseases calling for our notice.

One-half of this number were *disorders of menstruation.* One-third of the remainder *leucorrhœa.* Nearly as many of *prolapsus* and *cancer uteri.* A considerable number of cases of inflammation of the *labia pudendi,*—of inflammation of the *cervix uteri,*—of abscess of the breast,—with several of irritable *uterus* and puerperal fever.

The inflammation of the *labia pudendi*, or of the external orifice of the *vagina*, was always accompanied with severe pain, scalding on passing water, with a sense of bearing down, together occasioning much distress to the patient.

On examination, a deep blush of inflammation, with perhaps a slight ulceration, was all that could be detected, apparently by no means equal to the irritation excited.

The treatment consisted of aperients, with the local application either of black wash or a lotion of sugar of lead. The ulcerations were touched with nitrate of silver.

These cases were all speedily cured.

Inflammation of the vaginal canal, giving rise to *leucorrhœa*, presented itself in females of all ages, from young children to aged women. In some, the symptoms so strongly resembled *gonorrhœa*, as to render the diagnosis difficult, except in those cases where the character of the patient removed all doubt of venereal contagion.

In others, the usual leucorrhœal symptoms were observed,—no increase of heat in the vagina, no pain, and little or no scalding in making water.

With regard to the desideratum so much sought by all writers on this subject,—the distinction I mean between vaginal and uterine *leucorrhœa*,—although the observations I have made do not elucidate every case, yet they apply to a considerable class. In most cases of chronic vaginal *leucorrhœa* which I have satisfactorily made out, no increase of the discharge takes place before or after the recurrence of the menstrual flux; whereas in another and very large class of patients the discharge is doubled or trebled in quantity frequently before, but always after the catamenia, with an exacerbation of the general distress.

I think, too, that I have found the constitutional symptoms hereafter to be noted mainly confined to this class.

The treatment, likewise, by astringent injections, which succeeds so well in vaginal *leucorrhœa*, almost invariably aggravates this form of disease, and in some cases caused a too early reappearance of the menses.

The above reasons appear to be sufficient ground at least for a distinction between the two classes of cases, and I think also for attributing the latter class to an affection of the mucous membrane lining the *uterus*. In these cases more relief was experienced from blisters to the loins, with rest, gentle laxatives, bitter infusions, and generous diet, than from any other treatment.

Vaginal *leucorrhœa* was treated principally by injections containing sulphate of zinc, alum, or super-acetate of lead, in considerable quantities.

I have also used injections with nitrate of silver; and, as far as my experience goes, I can safely affirm, that it is the best remedy we possess. I have scarcely met with a case of its failure when fairly tried. It caused no irritation, and the doses may be increased without fear.

I generally begin with a scruple once or twice a-day, and increase it to twenty-five or thirty grains after two or three days.

Of disordered menstruation there were, of course, three varieties—*Amenorrhœa*, *Dysmenorrhœa*, and *Hemorrhagia*, with the irregular discharges which take place previous to the cessation of that excretion.

In several patients who suffered much, the *dysmenorrhœa* proved no bar to conception, contrary to the general statements of authors.

The first object in the treatment of *amenorrhœa* was, of course, to produce or recal the discharge;—in some we were successful, in others we failed. In addition to the cases related by Dr Bardsley of Manchester, of the beneficial effects of *strychnine*, I have to record one to whom I gave it in doses of one-twelfth of a grain, increasing to one-eighth three times a-day. In the course of a week the discharge appeared, having been absent ten months previously. It has since recurred naturally. In most cases there were symptoms present which precluded the use of this remedy. We tried aloes alone, and in combination with assafœtida, very extensively, and with great benefit. The menses often returned under its exhibition; and when they did not, the general health was improved.

The various preparations of iron were administered, and often with good effect.

Some cases, however, resisted every remedy that was tried.

The *dysmenorrhœa* was much relieved by the use of opium in grain-doses an hour or two before the expected attack and during the paroxysm. The addition of two or three grains of camphor is often useful.

I found opium in large doses an excellent medicine in *hemorrhagia*. It often stops, or at least diminishes, the discharge, and is not attended with any inconvenience. Preparations of iron were of use, and frequently a blister to the loins.

In two most able lectures published by Dr Addison, of the Borough Hospitals, London, he has described, with great accuracy and minuteness, a train of constitutional symptoms arising from uterine irritation in *leucorrhœa*. In the investigation to which the perusal of his little work led me, I was struck with the great similarity of the symptoms resulting from long-continued *leucorrhœa* with those from disordered menstruation; and now, after noting down accurately upwards of ninety cases of the latter, and half that number of the former, I find them on comparison to present nearly the same aspect.

There are four symptoms common to both, which I have placed in the order of the frequency of their occurrence.

1. Pain of the head. 2. Deep-seated pain across the lower part of the back. 3. Pain under the left breast. 4. *Globus hystericus*, or a sense of tightness across the upper part of the *thorax*.

The pain in the head is often very severe,—sometimes accompanied with intolerance of light and sound, but very seldom with the same degree of general disturbance which a similar amount of pain from organic disease would occasion.

The pain in the back is deep-seated, and referred by the patient to some part mid-way between the *pubis* and *sacrum*.

The pain under the left *mamma* is often increased by a full inspiration, sometimes by pressure, but may be easily distinguished from thoracic disease by the stethoscope.

Other symptoms, such as disordered stomach and diarrhœa, occur sometimes, though much less frequently than those above described.

The tongue is seldom loaded, though often white. The pulse generally remains quiet, soft, and small.

If the original and originating affection be removed, these symptoms generally soon disappear; but when that is incurable, we have found considerable relief obtained by the use of aloes and asafœtida, with local irritation occasionally renewed. Many patients under this treatment have recovered a tolerable share of health. Other medicines may be given according to the state of the patient. Bitter infusions, air, and exercise, are often beneficial.

Under the term inflammation of the *cervix uteri*,—I do not include that inflammation of the glandular structure described by Sir C. M. Clarke, but inflammation of the substance of the *cervix*. The symptoms observed were, pain referred to the centre of the *pelvis*, a sense of weight, and sometimes a mucous discharge.

On examination, the *os uteri* was found rather lower than natural, the *cervix* swollen, somewhat hard, hot, and tender to the touch.

In most it appeared as a chronic disease. The remedies most useful are bleeding, local and general, hip-baths, or tepid injections, with mild purgatives.

None of the cases were found obstinate.

The cases of irritable *uterus* resembled exactly the description of that disease by Dr Gooch; and the treatment he recommends was found the best; long rest, with the occasional use of belladonna or hyoscyamus, attention being paid to the stomach and bowels at the same time.

The usual course of symptoms was observed in the cases of *cancer uteri*. Severe lancinating pains were felt in the pelvic region extending downwards to the *anus*, which the patients almost invariably attributed to piles, and a very fœtid discharge of variable consistence and colour, sometimes with hemorrhage, took place. On examination, the *pelvis* was more or less filled with a hard irregular mass, glueing together the *uterus* and *rectum*, with greater or less destruction of the *cervix uteri*.

Towards the termination in several cases the bladder became involved, and perforation of that viscus took place.

All these cases proved fatal. Nothing could be done but to afford transient relief to the most pressing symptoms. Hyoscyamus and opium in large doses sometimes alleviated the acute pain; and the distressing dyspepsia frequently yielded to a combination of blue-pill with rhubarb.

Great benefit was experienced from keeping the bowels in a state of moderate relaxation, as the pressure of hardened feces caused great torture.

Iodine was tried in some cases, but without more than the usual effect of improving the appetite and digestion.

The cases of puerperal fever were not numerous, nor, with one exception, were they severe. Most of them presented peritonitic characters, and were relieved by calomel and Dover's powder, with fomentations, &c. without blood-letting.

One of them, however, possessed much interest, as exhibiting well-marked *hysteritis*. She had been delivered by a midwife, and the day after exposed herself to cold—was immediately seized with shivering and pain in the belly. The *lochia* stopped.

When I saw her, the pain of the belly was excessive and universal; she could not bear me to touch her; the tongue was foul and dry, with *sordes* about the teeth; pulse 130, small and hard; some thirst and headach.

I prescribed bleeding, fomentations, and gentle purgatives; and on my visit the following day, I was much surprised to find the general tenderness of the abdomen very much diminished, without a corresponding improvement in other particulars. I found now that she could bear slight pressure all over the belly. Just above the *pubis*, by careful manipulation, I could trace the rounded outline of the *fundus uteri*, and pressure over this part did not annoy her until I felt myself touching the *uterus*. If I now increased the pressure, she suffered acute pain.

I do not know whether this peculiarity has been remarked before. If it be generally the case, it will materially assist our diagnosis of *puerperal hysteritis* from *puerperal peritonitis*.

The patient continued to become worse, in spite of the prompt employment of the usual remedies, bleeding, calomel, blisters, &c. A slight discharge of puriform matter took place from the *vagina*, with no relief to the symptoms however. She suffered great pain in paroxysms. Pulse 110, small, weak, and sometimes intermitting; tongue dry and furred; and she appeared far too much exhausted for further depletion.

I saw, just at this time, Dr William Stokes' excellent paper in the Dublin Journal on the Use of Opium, where antiphlogistics are precluded, and I determined to try it. I ordered, therefore, twelve pills, each containing one grain, and told the patient to take one whenever the paroxysms of pain recurred.

The most beneficial change resulted. In a few days the pain ceased, the pulse became slower and fuller, the tongue cleaner, and gradually the swollen *uterus* diminished in size. The patient is now perfectly well.

During the time she took the opium no other remedies were employed; and, when I prescribed it, she was apparently all but out of the reach of medicine.

Young women after their first confinement appear peculiarly subject to inflammation of the mammary gland, terminating in abscess. Whether or not this may be explained from the analogy of secretion with inflammation, as suggested, I think, by Meckel, future observations may *determine*. There is one very common fact, which would appear to support this view. Many cases occur in which, after milk has been secreted, the breast continues to swell,—becomes hot, painful, and hard. The secretion is then suspended. Remove now the *excess* in the action going forward, the breast will be restored to its former state, and the secretion reappear.

To obtain this effect leeches may be necessary, or even a general bleeding, with fomentations and purgatives, combined with tartar-emetic in small doses.

When these means failed and abscess formed, it was generally allowed to break spontaneously. None of the cases were tedious. The wound speedily healed, leaving in some, however, a degree of hardness after it.

We did not find the patients more liable to subsequent attacks of abscess than those who had *not* previously suffered from it.

104, *Stephen's Green*, *Dublin*.

ART. VI.—*An Account of an Improved Mode of Administering Sulphate of Magnesia (Epsom Salt), whereby it is rendered an agreeable, safe, and efficacious purgative, applicable to almost every case in which a purgative is required.* By JAMES HENRY, M. D. Vice-President of the King and Queen's College of Physicians in Ireland.

SATURATE any quantity of cold water with sulphate of magnesia; filter through paper, and add to every seven ounces of the solution one ounce of the *dilute* sulphuric acid of the Dublin or Edinburgh pharmacopœias.

Dose.—One table-spoonful in a wine-glass of water.*

In those cases in which the bowels are very easily moved, a single table-spoonful is sufficient to produce a considerable purgative effect.

In ordinary cases, a table-spoonful taken an hour or two before breakfast produces one or two evacuations immediately after breakfast.

In other cases, the dose is to be repeated once or twice, at intervals of two or three hours, according to circumstances.

Where the symptoms are urgent, a table-spoonful may be given every hour until the effect is produced; and where the urgency is extreme, a saturated solution of the salt, containing only one-half of the above-mentioned quantity of acid, may be given in doses of two table-spoonfuls, repeated every hour.

This combination of sulphate of magnesia and sulphuric acid, administered according to the preceding directions, possesses the following properties.

1. It is an effectual purgative, never failing to move the bowels in all cases in which the bowels can be moved by medicine. I am not acquainted with any purgative which is more certainly effectual.

2. It is quick in its operation; the effect being produced in ordinary cases within two or three hours after the first or second dose, and a necessity rarely arising for the continuance of the medicine beyond the third dose.

3. It is safe, never purging so as to produce exhaustion.

4. It does not give rise to the slightest degree of nausea, but, on the contrary,

5. Quickly puts a stop to nausea, and appeases irritability of the stomach.

6. Flatulence, that most distressing attendant upon constipated bowels, is immediately and signally relieved by this medicine, which not only promotes the expulsion of the *flatus* already generated, but diminishes the tendency to its further secretion.

7. In a few minutes after this medicine has been swallowed, so agreeable a sensation of warmth is felt in the stomach, that the medicine is not only readily taken, but even relished by many persons whose stomach will not retain any other liquid purgative, unless impregnated with the hottest aromatic tinctures.

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* Each table-spoonful contains about two drachms of sulphate of magnesia, and half a drachm of dilute sulphuric acid.

8. The operation of this medicine is not attended by either sickness, faintishness, or griping. In this respect the acid saline solution possesses a remarkable superiority over all the purgatives in common use.

9. This medicine can be taken every day, or every second day, for a considerable length of time, not only without impairing the stomach or other digestive organs, but with manifest advantage to them.*

10. The continued use of this medicine does not produce that irritation of the *rectum* which so commonly attends the continued use of other purgatives.

11. This medicine is not disagreeable to the sight, being perfectly limpid and transparent as the purest spring water.

12. It has no smell.

13. The bitter nauseous flavour of the sulphate of magnesia being almost completely hidden by the acid, the taste of the solution can hardly be said to be at all disagreeable, and is certainly much less so than that of most other liquid purgatives.

14. It is cheap.

15. It is easily procured everywhere.

16. It keeps for an unlimited length of time.

From the experience of three years, during which I have made daily use of this purgative in the course of my practice as a physician, I have ascertained that the acid saline solution possesses the properties which I have just enumerated.†

The great superiority of this mode of combining and administering sulphate of magnesia, above all the other modes in which it has been hitherto administered, will appear from a comparison of the effects of the solution made, as above directed, with those of sulphate of magnesia, whether administered as a domestic remedy, or under the direction of the physician.

Sulphate of magnesia, when used as a domestic remedy, is dissolved in warm water, in the proportion of one or two ounces of the salt to a large tea-cup of water. This is taken at a single draught. Thus taken, sulphate of magnesia seldom fails to produce several copious liquid evacuations, and has accordingly acquired great celebrity, both in these countries and on the continent of Europe, as a safe and efficacious purgative. In this form, however, it is attended by the following inconveniences, from all of which the acid solution above described is entirely free.

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* The frequently repeated contact of the acid saline solution being injurious to the teeth, it is useful to adopt the precaution of taking the medicine through a quill, or from the spout of a small tea-pot, whenever it is necessary to continue its use for any length of time.

† Several persons to whom I have given this medicine have told me, that, some years ago, they obtained a medicine strongly resembling it, both in appearance and properties, from a gentleman in this city, since deceased, who prepared it himself, and vended it as a nostrum.

1. It is to all persons extremely disagreeable, and by many cannot be swallowed at all.

2. So large a quantity taken at one dose is apt to produce, almost immediately, heaviness, headach, and even nausea.

3. This dose, as it is called, of Epsom salts operates severely, producing almost always so may copious liquid evacuations, as to inconvenience even the robust, and not unfrequently to reduce invalids and debilitated persons to a state of dangerous exhaustion.

4. A distressing flatulency of stomach and bowels accompanies its operation, and continues for some time afterwards.

5. Although the immediate effect of a dose of Epsom salts is to open the bowels freely, yet it is almost invariably found that the costiveness which follows the operation of the medicine is worse than that which it was taken to relieve.

In order to obviate the inconveniences attendant upon the operation of sulphate of magnesia, administered uncombined and in a full dose, physicians usually administer it in divided doses, and in combination with various other medicinal substances. Thus they frequently direct two ounces of the salt to be dissolved in from six to eight ounces of the acid infusion of roses, and one or two table-spoonsful of the solution to be given every second or third hour. By this means they obtain the following advantages.

1. The medicine being taken in divided doses, the ill effects of a full dose taken at once are avoided.

2. The disagreeable taste of the salt is in a considerable degree hidden by the infusion of roses, and by the small quantity of sulphuric acid contained in it.

3. The acid contained in the infusion of roses contributes in some degree to make the salt lie more easily on the stomach, and to prevent griping.

But although sulphate of magnesia thus administered possesses these advantages over sulphate of magnesia as taken popularly, and without medical advice, yet it is still defective as a remedy; because, first, the proportion of the salt to the water in which it is dissolved is so small, that a great quantity of the solution must be taken before the effect is produced, by which means unnecessary trouble is given to the patient, and much time lost. Physicians, sensible of this disadvantage, do not usually administer the salt in this form, except to persons whose bowels are easily moved by medicine; and if they do administer it in this form to others, are under the necessity of giving a mercurial or resinous pill on the preceding night, which, by its activity, may compensate for the inactivity of the salt. Thus, two medicines are used, where, if a saturated solution of the salt were employed, one would suffice. *Secondly*, The quantity of acid in the infusion of roses is not sufficient to hide the disagreeable flavour of the salt, much less to correct its nauseating and griping properties. Physicians, therefore, very often add a drachm, or two drachms of the dilute sulphuric acid to the solution, thereby rendering it less nauseous and griping. But this quantity of acid is, as I have ascertained by repeated trials, utterly insufficient to neutralise effectually the disagreeable properties of the salt,—*an entire ounce of the acid being required for every seven ounces of the solution.*

On other occasions, the physician, instead of the infusion of roses, uses some one of the warm distilled waters as a solvent for the salt, and adds to the solution either a purgative or an aromatic tincture, or both. All these complicated processes are used to effect that which is more readily, more certainly, and more cheaply effected by the simple formula, which it is the object of this paper to recommend, Prepared according to that formula, the acid saline solution is a purgative capable of almost universal application, being not only well suited for domestic use, and for the practice of the physician, but being pre-eminently adapted for employment as the ordinary purgative of hospitals, dispensaries, and other public institutions, and more especially of the army and navy services.

It is adapted for domestic use, because it is safe, efficacious, easily prepared, devoid of disagreeable taste and smell, does not produce nausea or griping, and keeps for an unlimited length of time.

It is suited to the practice of the physician for the same reasons, and also because it is not only an elegant-looking preparation, being, when used singly, as transparent as the purest spring water, but is easily given in combination with other medicinal substances, as sulphate of quinine, &c. By diminishing the quantity of the salt, or increasing that of the water, as well as by the increase or diminution of the dose, the physician can adapt the medicine still more accurately to the particular circumstances of each case. He can also at pleasure alter its flavour and appearance, by adding to each half-pint of the solution, half an ounce of the infusion of roses, or of any coloured syrup,—as the syrup of red poppies, which gives the solution a rich red colour, or the syrup of saffron, by which it is rendered a beautiful yellow. Except in a few rare cases, the quantity of the acid ought not to be much increased beyond what I have specified. I have, however, given it in double the quantity, without any bad effect; but I would not recommend the practice for general adoption.

The acid saline solution is besides peculiarly adapted for the use of hospitals, dispensaries, and the army and navy services; because, in addition to the valuable properties just enumerated, it is cheap, easily procured, easily carried,* and may be made to supply the place of almost every other purgative.

In all these respects it is infinitely superior to the ordinary purgative of our public institutions, which consists of an infusion of senna, holding in solution either sulphate of magnesia or sulphate of soda, or both, and commonly known by the name of the "black bottle." This medicine, in as much as it contains senna, is,

First, Expensive in the first purchase.

Secondly, Containing senna it will not keep, for which reason much of it is lost, and the expence thereby considerably enhanced.

Thirdly, Containing senna, it has a most nauseous odour.

Fourthly, Containing senna, it has a most disagreeable appearance, whence its popular name, "black bottle."

Fifthly, Containing senna, it is apt to be rejected by vomiting. This emetic property of the medicine is, when not desired, always distressing, sometimes injurious to the patient, diminishes and delays its purgative effect, and increases the expence, in as much as it makes a greater quantity necessary.

Sixthly, Containing senna, it produces at the time of the operation of the medicine considerable sickness and griping.

To obviate this inconvenience, it is usual to combine aromatic tincture with it, by which not only is the expence very considerably increased, but the medicine rendered less fit for many cases.

Seventhly, The ordinary dose of the "black bottle" is one wine-glassful, which is at least thrice the bulk of the largest dose that is ever required of the acid saline solution.

Eighthly, Senna cannot always be procured, especially in country parts; and when it can be procured, is frequently of bad quality, its high price affording an inducement for the introduction of inferior qualities into the market, and for the adulteration of the superior kinds by the admixture of various substances.

Ninthly, The superior kinds of senna being the produce of a foreign country, the supply may be stopped by various accidents, as by war, foreign export, regulations, &c.

Tenthly, The money paid for senna is so much sent out of the country, while sulphuric acid being of home manufacture, the money expended on it circulates at home.

Eleventhly, For making the "black bottle," boiling water is required, and, even after the boiling water has been procured, an hour must elapse before the senna is sufficiently infused. As the infusion does not keep more than two or three days, (and in warm climates not even so long,) only a small quantity of it can be made at once. On the other hand, the acid saline solution can be made in the space of a few minutes, and in any quantity.

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* It is scarcely necessary to observe, that in the army and navy services, the salt should be carried in the dry state, and the solution made only when wanted for use.

I have instituted the preceding comparison between the acid saline solution and the "black bottle," because the latter is the ordinary purgative of our public medical institutions. It is as unnecessary, as it would be tedious, to compare the acid saline solution with each individual purgative employed by physicians.

Every physician will of course be guided in the choice of his purgatives by the peculiar circumstances of each case, but there is no purgative so generally applicable to all cases, so safe, so agreeable, and at the same time so efficacious, as the acid saline solution. It is the reproach of our art that the means which we employ to remove disease are almost always disagreeable, sometimes as disagreeable as the diseases themselves.

Our purgatives particularly subject us to this reproach, and in an especial degree, our liquid purgatives. If I shall have succeeded in introducing to general notice a liquid purgative which is not disagreeable, either to the taste or smell or sight, while at the same time it is efficacious, without producing sickness or griping, I shall feel that I have contributed somewhat to lessen the reproach hitherto but too justly cast upon our art, and that the time which I have bestowed on this subject has not been thrown away.

Dublin, September 1833.

ART. VII.—*Cases of Mental Derangement terminating fatally, with the Appearances disclosed by Inspection.* By JOHN SMITH, M. D. Fellow of the Royal College of Physicians, Edinburgh, and Physician to the City Charity Work-House and Lunatic Asylum.

1*st.* JOHN FERGUSON, æt. 33, black hair, and sallow complexion, stout make, a discharged soldier, unmarried, was admitted into the Asylum on the 18th July 1818, in a state of deep melancholy. He was dismissed on the 28th of the following March; but, having become worse, he was re-admitted in May. He was now sunk in the deepest melancholy and despair, indifferent to everything around him, and very averse to taking food. There was no rousing him to take exercise, or enter into conversation. He remained stationary with his eyes fixed and staring, which gave to his expression a melancholy wildness. He continued in this state, undisturbed by delirium, till the middle of August, when his health began to decline. From persisting in refusing his food he had become very much emaciated, and diarrhœa supervening, he sunk quite exhausted on the 29th September.

The head was examined twenty-four hours after death.

The scalp adhered firmly to the *pericranium*, and whilst separating it, a considerable quantity of blood oozed out. The skull-cap being removed, the *dura mater* was found loaded with blood. There was considerable serous effusion under the arachnoid membrane, which was likewise thickened. The *pia mater* was now thickened and vascular. The brain felt firmer than usual, and, on slicing it, innumerable red points were seen. The ventricles contained no serum; but the congestion throughout the brain and membranes was very great.

2d. Thomas Boswell, æt. 30, dark hair, ruddy complexion, stout-make, unmarried, a sailor, was admitted into the Asylum in February 1819. He had been insane for about a year; and a fall upon the head was assigned as the cause. He was violent and irascible, and his intellect was very much impaired. He was subject to fits of a particular nature, which attacked him generally every two or three weeks. They lasted from three to five minutes, and they returned repeatedly in the course of the day. During the fit the face was much distorted and flushed; the eyes were fixed; and he foamed slightly at the mouth; his arms and legs were violently agitated, and his fists clenched. They seemed very much to resemble epilepsy, but he did not fall down. He did not complain of any uneasiness after them, and they seemed to follow any irritating cause, or a disordered state of the stomach and bowels. For about six weeks before his death he became indifferent about his food; and his irascibility and violence passed into listlessness and stupor. He became daily weaker and more stupid, and died in a state of coma.

Examination twenty-four hours after death.—Forehead low; head very small; scalp adhering very firmly to the *pericranium;* no oozing of blood whilst dividing it; skull very thick, being about two-thirds of an inch; brain, *cerebellum*, and *medulla oblongata* were very firm, and cut like a piece of cork; membranes free from congestion, but somewhat thickened; no effusion between them, or in the ventricles.

3d. William Mackracken, æt. 35, clerk, swarthy complexion, slender make, unmarried, was admitted on the 1st August 1823. He was in a state of high maniacal excitement, and had been so for several weeks. Intemperance was assigned as the cause.

He fancied that he was descended from the great Sir William Wallace; and that he equalled him in strength and stature; and he was constantly boasting of his great powers, and of what he could do. He also supposed that he was a first-rate singer and dancer, and was most anxious that you should see him perform. But his attempts in this way were a complete failure, showing the fallacy of his ideas upon these points, as did his thin and slender make belie his fitness for the Herculean feats of Wallace.

About a month from the time of his admission, he was observed to speak with a degree of hesitation; his pupils were dilated; and his expression was stupid. This change, though it rendered him less fit for representing the characters he had assumed, did not at all diminish his confidence in his own powers; and he was constantly making vain and fruitless attempts. Matters continued in this state for about a month, when an aggravation of the symptoms took place. His memory now failed him very much. His articulation had become more indistinct, and he staggered when he walked. He made frequent attempts to express himself; but, by the time he had mumbled a word or two, he seemed to have forgot what he intended to say, and, turning his head aside, he looked dissatisfied. *Coma* gradually supervened, and he died on the 12th of October.

Examination.—The scalp adhered loosely to the *pericranium*, and a good deal of blood oozed out whilst dividing it. The *cranium* was of a natural thickness; but on raising the skull-cap, the *dura mater* was ruptured, and a considerable quantity of serum escaped. The *dura mater* and *pia mater* were loaded with blood; and under the arachnoid, as well as between it and the *dura mater*, there was considerable serous effusion. The brain was preternaturally firm. It felt elastic, and cut like a piece of cork. Very few red points were seen in its substance. On reaching the ventricles, they were found to contain about six ounces of serum. The *cerebellum* and *medulla oblongata* possessed the same degree of firmness as the brain.

4th. J. J. Elliott, bookseller, æt. 32, black hair and swarthy complexion, slender make, unmarried, was admitted on the 8th August 1822. He had been insane for several years, and was brought from a lunatic asylum in London. He was proud, haughty, and contemptuous, seldom deigning to speak, but to utter abuse, and to insult. From the high notions he entertained of himself, he kept aloof from the other patients, and would not sit at table with them. He was vicious, passionate, and morose; talked much to himself, and was frequently heard muttering the most horrid imprecations. When a question was put to him, he generally answered it in the most taunting and sneering manner. He seemed to be governed by the blackest and most malignant passions, and to be at enmity with every thing human. He had no respite from this wretched state, and no smile ever lightened his countenance. Even on his deathbed, when quite exhausted, and unable to move a limb, this spirit remained unchanged. He uttered his imprecations, and repelled with disdain all the attention and kindness of the attendants. He died on the 12th October 1823, having for several weeks laboured under slight fever, accompanied with *diarrhœa.*

Examination.—Much blood oozed out whilst dividing the scalp, which adhered firmly to the *pericranium;* the membranes were loaded with blood; and there was considerable serous effusion under the arachnoid coat. This membrane, as well as the *pia mater*, was much thickened. The brain was of natural firmness; but throughout its substance innumerable red points were seen; no serum was found in the ventricles; but the vessels on their surface, and in the *plexus choroides*, were full of blood; great congestion was evident in all the membranes, and throughout the substance of the brain and *cerebellum.*

5th. Isabella Hay, æt. 25, unmarried, stout and short make, fair complexion, was admitted into the Asylum in December 1821. She was reported to have been for several years subject to epileptic fits, accompanied with wild delirium. During her residence in the asylum, she generally had a fit once a month, which lasted from five to ten minutes, and was accompanied with violent convulsions, particularly of the right side. In the intervals she was vicious and intractable, and her intellect was very much impaired. She died during a fit on the 21st October 1822.

Examination.—The skull-cap being removed, nothing remarkable was observed in the state of the *cranium* or membranes. On slicing down the brain to come at the ventricles, the left was reached sooner than was anticipated, from its being distended with serum. It contained fully ten ounces, and its cavity occupied the greater proportion of the middle and posterior lobes. The right ventricle was of its natural dimensions, and contained about an ounce of serum. The brain was rather firmer than natural, but free from marks of vascularity.

6th. Isabella Beaton, æt. 25, stout-make, dark hair, and ruddy complexion, was admitted on the 14th June 1824. She had been in a state of melancholy for about eight months, and her previous life had been irregular. Her countenance expressed the utmost degree of mental suffering; she was constantly wailing, and repeated frequently the word "clean." She was restless and agitated, and appeared quite bewildered, not knowing what to do or how to act. There was a degree of tremor all over her, and her tongue faltered when she spoke. Her mind was very much obscured, and she could give no information about herself. She continued in the above state for several months, when symptoms of compression of the brain at length ensued; the pupils became dilated, and the pulse slow and feeble; she lost in a great measure the power of motion; and she passed her feces and urine involuntarily, and her mind became daily weaker. She lingered in this wretched state till the 21st February 1825, when she died quite comatose.

Examination.—Body much emaciated; scalp very thin; skull preternaturally thick. The vessels of the *dura mater* were loaded with blood, and there was considerable effusion under it, and also under the arachnoid coat, and extending over the whole surface of the brain and *cerebellum;* vessels of the *pia mater* turgid; brain of natural firmness, and free from congestion. The ventricles were much distended, and contained about ten ounces of serum. There was also considerable effusion under the *tentorium.*

7th. Peter Napier, æt. 34, printer, tall, and well-made, melancholy temperament, married, was admitted on the 14th December 1824. He was then labouring under deep melancholy, and had been so for about two years. Some family disputes were assigned as the cause. He was calm and harmless, but so obstinately silent, that the sound of his voice was not once heard during his residence in the Asylum. This silence did not arise from any apparent defect of the organs of speech, or from palsy, but from the influence of some melancholy impression. He took his food with great reluctance, and seldom did he eat a sufficient quantity. There was an extensive sore over the *sternum,* which had been the effect of a burn badly managed. The granulations had been allowed to grow up in a loose and flabby manner, and sinuses had formed under them, from which there was a constant thin discharge. From this cause, and the denying himself a sufficiency of food, his health began to suffer, and he gradually sunk from increased debility. He died on the 21st May 1825.

Examination.—The scalp adhered firmly to the *pericranium,* and much blood oozed out whilst dividing it. The skull was of natural thickness. The membranes were gorged with blood, but there was no effusion between them. The brain was of natural firmness, but throughout its substance innumerable red points were seen. There was no water in the ventricles, nor under the *tentorium.*

8th. Alexander Boiter, æt. 27, mason, slender make and sallow complexion, unmarried, was admitted on the 23d March 1823. He had been in a state of melancholy, accompanied with frequent fits of excitement, for about six months. No particular cause could be assigned for his illness; but he was observed to be careless and indifferent about his work, and to be very passionate and irritable, from a supposition that he was ill-used by his master and fellow-workmen.

His mind was very much impaired, and he was unable to give any intelligible account of himself. He was subject to occasional fits of excitement; and, during these, he would attempt to explain himself; but he was unable to do so, from the impaired state of his memory, and consequent want of language. He seemed to feel his inability to express his sentiments very much, as his failure in attempting it was generally followed by considerable emotion, and shaking of the whole frame. During his residence in the Asylum his skin gradually assumed a very singular appearance, having become all over of a deep-brown colour, as if he had been labouring under black jaundice. This led to the suspicion that his liver was diseased; but, on examination, no enlargement or hardness could be felt. His bowels were regular, and his stools natural. He had no pain in the region of the liver, and his appetite was in general good.

About two months before he died his health began to give way, and symptoms of *phthisis* to appear. He had hectic fever, with tough and purulent expectoration. He died on 31st August 1825, very much emaciated.

Examination.—The scalp was thin, and adhered loosely to the *pericranium.* The skull was particularly thin. The vessels of the *dura mater* were rather turgid; and there was considerable serous effusion between that coat and the arachnoid, as well as between that membrane and the *pia mater*, and extending all over the surface of the brain. These membranes were slightly thickened. The brain felt softer than natural, and the cineritious portion was remarkably pale. The interior of the brain was free from red points. The state of the *cerebellum* was very similar.

Thorax.—Right lung free from adhesion, but much indurated towards the upper part. It felt gritty when cut into, and *pus* oozed out from innumerable sacs. The left lung was free from adhesion, except at the upper part, and was converted into a substance resembling cheese, and full of small sacs filled with purulent matter. No morbid appearances of the heart.

Abdomen.—The stomach contained a considerable quantity of a dark fluid, resembling a solution of China ink. The liver and other *viscera* were free from any morbid change. From the appearance of the skin, I was certainly led to expect that the liver or its appendages would be found diseased; but the case not being so, I have ventured to account for it, from the blood being imperfectly oxygenated from the very disorganized condition of the lungs.

9th. William Glass, coachman, æt. 30, swarthy complexion, slender make, married, was admitted on the 6th September 1825. He had been ill for about a fortnight, and was in a state of high maniacal delirium, accompanied with much febrile excitement. It was said to be his second attack, and that he was intemperate in his habits.

By the use of blood-letting and other depletory means, the febrile action was soon in a great measure overcome, without the delirium being subdued. On the 25th, symptoms of compression of the brain began to appear. His pupils were observed to be dilated; there was considerable stupor; his articulation was indistinct; and he passed his urine and feces involuntarily.—He died comatose on the 3d of the following month.

Examination twenty-four hours after death.—Much blood oozed out when dividing the scalp. The *cranium* was of natural thickness. The membranes throughout were loaded with blood. Between the *dura mater* and *tunica arachnoides* there was considerable serous effusion, and also under the latter membrane, and filling the interstices between the convolutions. The *pia mater* was very vascular; and throughout the substance of the brain, numerous red points were seen. The brain was not preternaturally firm. The ventricles contained about two ounces of serum; and there was considerable effusion under the *tentorium*, between the *dura mater* and arachnoid, and in the subarachnoid tissue.

10th. Mrs J. Barret, æt. 65, fair complexion, slender make, married, had been a patient in the Asylum for ten years. She was vicious, suspicious, and irascible, and her mind was very much impaired. Besides oaths and imprecations, she seldom uttered another sentence than "Do you know my husband?"—"Take me to my husband." She was never free from irritation, and was always ready to use violence and abusive language. For some months before she died she became very suspicious, and refused her food. Her strength gradually gave way in consequence; and she died, without any particular complaint, on the 4th October 1821, very much emaciated.

Examination thirty hours after death.—Scalp thin, and adhering loosely to the *pericranium;* skull of natural thickness; *dura mater* free from congestion, and easily detached from the cranium; arachnoid coat and *pia mater* very loosely attached to the brain. The brain itself was softer than natural, and appeared shrunk, and showed no marks of congestion. There was no effusion into the ventricles, or in the subarachnoid cellular membrane.

11*th*. James Aitkin, æt. 40, swarthy complexion, stout-make, was admitted on the 11th October 1825. He was sent from Bridewell, and was much excited, and very incoherent. He had not been many days in the Asylum, when symptoms threatening compression of the brain began to appear. There was great loss of memory, with stupor, and a bewildered expression of countenance. He continued in this state, with gradual aggravation of the symptoms, till about the middle of December, when he became much worse. He now lost the power of motion, and he passed his urine and feces involuntarily. Coma ensued, and he died on the 25th.

Examination of the head thirty hours after death.—The head was large, and there was a sudden swell at the temples. The forehead was low, and the crown flat. The scalp was thick, and adhered firmly to the *pericranium*; and whilst separating it, there was much oozing of blood and serum. The skull was of natural thickness; and in raising the skull-cap, the *dura mater* being ruptured, a considerable quantity of serum escaped. This membrane was gorged with blood, and between it and the arachnoid there was extensive serous effusion. Such was also the case under the arachnoid coat and between the convolutions. On the upper parts of the posterior lobes some blood was effused—about half an ounce. The *pia mater* was very vascular, and the anterior lobes adhered together. The cineritious substance was of a deeper colour than usual; and the medullary approached to grey, and was studded with innumerable red points. On passing the *centrum ovale*, these diminished, and towards the base of the brain, the colour was nearly white. The ventricles contained no serum; but there was a number of minute globular vesicles distended with serous fluid in the course of the *plexus choroides*. The brain throughout was much firmer than natural, but particularly above the ventricles. The *cerebellum* did not show the same degree of vascularity, nor was it preternaturally firm. The *medulla oblongata* was very firm, of a darker colour than usual, and surrounded with serum.

12*th*. Margaret Simonet, æt. 33, dark hair, swarthy complexion, tall, and stout make, unmarried, was admitted into the Asylum on 30th May 1821. She was a native of Switzerland, and had been insane for about a year. Her hallucinations were of a religious nature, accompanied with great excitement and passion. She talked much of visions, and of being in company with Jesus Christ. Her paroxysms were frequent; and during them she raged and swore much, and beat her breast violently. Her manner was haughty and contemptuous. Till within two months of her death, her general health was very good. She then became dull and indolent, and had a strong desire to lie a-bed. She had no particular complaint; but looked pale, and was indifferent about her food. About a week before she died, she showed occasionally great difficulty of breathing, and complained of dull pain in her right side. She died suddenly on the 6th of March 1828.

Examination twenty-four hours after death.—The head was round and well-formed, projecting a good deal above the ears. The scalp was thick, and adhered firmly to the *pericranium*. The skull was of natural thickness. The membranes did not exhibit any morbid changes, nor were they congested. There was a slight degree of serous deposition under the arachnoid. Nothing particular was observed as to the substance of the brain. The ventricles contained about an ounce of serum, and there were a few vesicles in the course of the choroid *plexus*. The *cerebellum* appeared proportionally small to the size of the brain.

Thorax.—In dividing the ribs on the right side, the *pleura* was opened, and a quantity of serum escaped. The *sternum* being removed, the right cavity of the *thorax* was found filled with serum. The lung was of a pale livid colour, much shrunk in size, but sound in structure. The *pleura costalis* was much thickened. There was no effusion in the left cavity, and the lung was quite natural. The *pericardium* contained about an ounce of the serum; and the heart was rather large, blanched, and soft. The right ventricle was full of fluid blood; the left of coagulated.

Abdomen.—On opening the *parietes*, the stomach was seen filling the epigastric and right hypochondriac regions, and extending over the umbilical to the right iliac region. It was distended with air. The transverse arch of the colon was much contracted, not exceeding in calibre the circumference of the thumb. The liver, spleen, and other *viscera*, were quite sound. But the gall-bladder was much thickened and contracted, and grasped a rough gall-stone of the size of a small walnut. There were only a few ounces of serum in the *abdomen*. No *anasarca* of the legs.

13*th*. Peter Brown, æt. 28, fair complexion, stout-make, labourer, unmarried, was admitted on the 26th August 1823. He had been for several years subject to epileptic fits. They had become more frequent, and accompanied with a considerable degree of maniacal delusion. During his residence in the Asylum, he generally had a fit once in the three or four days, sometimes oftener, and occasionally he had several in the course of one day. They varied much in duration; but before he was seized, he was always more or less excited, and he generally awoke from them confused and irascible.

He died in a fit on the 3d February 1828, with his intellect much impaired, and his body much reduced, from the long-continued discharge of scrofulous sores in the neck.

Examination twenty-four hours after death.—Much blood oozed out in dividing the scalp. Skull preternaturally thick and dense,—being fully half an inch. The membranes were thickened and loaded with blood; slight effusion between them. Consistence of the brain natural. Numerous red points were seen in its substance. There was about an ounce of serum in the ventricles.

Thorax.—The thoracic *viscera* were sound.

Abdomen.—The stomach was much contracted in size, and its coats were thickened. The colon was very large in its transverse arch, which was inverted downwards, and reached below the navel. The other *viscera* were sound.

14*th.* Hugh Sutherland, æt. 60, fair complexion, tall and well-made, hair-dresser, married, had been subject to attacks of intermittent insanity for nearly twenty years. The paroxysms were in general accompanied with considerable excitement, and he talked incessantly of his wealth, power, and great connections. For the last two years of his life he had no interval from his delusions; but he was harmless, and seemed to be happy in the idea of his imaginary greatness.

As his strength declined, his mind did not clear up; on the contrary, his ideas seemed to become more extravagant and absurd. A few days before he died, he fancied that his wife (to whom he had a particular dislike) was dead, and that he was to be married to a young and beautiful woman, with an immense fortune. He died on the 25th July 1828, very much exhausted, but without any fixed complaint, and with his mind completely engrossed in talking of, and making preparations for, his young bride.

Examination thirty hours after death.—*Head.*—The head was large, with the forehead low, and backhead expanded and protuberant. The scalp adhered firmly to the *pericranium*; but the *dura mater* was very easily detached from the bone. It was thicker than natural, and there was considerable serous effusion under it. The *tunica arachnoides* and *pia mater* were also preternaturally thickened, and with considerable serous effusion between them. The brain was softer than usual, and few red points were to be seen throughout its substance. There was about half an ounce of serum in the ventricles; and in the course of the *plexus choroides* were several minute globular vesicles, distended with transparent fluid. The brain and membranes appeared rather free of blood.

Thorax.—The lungs were quite healthy, and free from adhesions. The heart was small and soft. There was considerable gelatinous effusion on the right side. The right ventricle was small, and its *parietes* very thin. The left was larger, and its walls moderately thick. The ascending *aorta* was a good deal enlarged, and was in many parts cartilaginous and bony.

Abdomen.—The *viscera* of the *abdomen* were, on the whole, sound. The stomach and gall-bladder were unusually small.

15*th*. John Stewart, æt. 36, dark hair and swarthy complexion, short and stout-make, hair-dresser, unmarried, had been subject to occasional attacks of melancholy for several years. He had once made an attempt upon his life. Of late his mind had become very much impaired. He was quite simple, and did not seem to be distressed with any melancholy feelings.

About six months before he died, he had a violent attack of *pleuritis* combined with *hepatitis*, and from which he completely recovered. He died suddenly in a fit of apoplexy on the 31st August 1829.

Examination thirty hours after death.—*Head.*—The head, neck, and shoulders were of a dark livid colour. The scalp contained much blood. The skull-cap was of natural thickness; and on removing it, the vessels of the *dura mater* were found gorged with blood; such was also the case with those of the *pia mater*. The brain was rather softer than natural, and throughout its substance many red points were seen. A small quantity of bloody serum was found in the ventricles; and their under-surface, particularly over the *thalami nervorum opticorum*, felt rough and broken, and very soft, and apparently in a state of incipient *ramollissement*.

Thorax.—The *pleura costalis* on each side was much thickened, and in many parts cartilaginous. The lungs were sound. There was slight effusion into the pericardium. The heart was natural.

Abdomen.—The liver and other *viscera* were free from morbid appearances.

16*th*. Elizabeth Lamb, æt. 40, dark hair, swarthy complexion, tall, and slender-make, unmarried, was admitted into the Asylum on the 28th July 1825. She laboured under deep melancholy, was in constant dread of being burned, and in despair as to the future. Her mind was not generally impaired; and she was rarely and but slightly excited. Her *abdomen* presented a singular appearance, for, instead of being prominent, it was quite concave, as if the intestines and *parietes* were adhering to the spine. She did not seem to suffer much inconvenience from this for a considerable time after her admission. But at length she began to complain of constant uneasiness, which was very much increased on her attempting to get into the erect posture. Her bowels became irregular, and her appetite gave way. From the pain she suffered in attempting to rise or walk, she became bed-ridden, and continued to linger in a very wretched state till the 22d September 1828, when she expired, very much emaciated.

Examination twenty-four hours after death.—*Head.*—The scalp was thin, and adhering slightly to the *pericranium*, which was easily separated from the bone. The skull was of natural thickness, and was easily raised from the *dura mater*, which was very dense, and its vessels were full of blood. The *glandulæ Pacchioni* were large, and there were deep depressions in the cranium in consequence. There was considerable effusion of serum under the *dura mater*, and also between the arachnoid and *pia mater*, filling the interstices between the convolutions. Both these membranes were also much thickened, particularly about the *vertex*, where the effusion was greatest, and where there were also numerous white granular bodies. The *pia mater* was very vascular. The brain felt much firmer than natural, particularly on its lower surface. The *tuber annulare* and *medulla oblongata* were very firm. Under the *tentorium* there were about two ounces of serum ; and a considerable quantity flowed from the spinal canal on lowering the head. Throughout the substance of the brain numerous red points were seen; and there was about an ounce of serum in the lateral ventricles. Several distended vessels were likewise seen on their surface. The *plexus choroides* was very much congested, and in its course were several small globular vesicles distended with limpid fluid, about the size of peas. The internal *lamina* of both ventricles was very much thickened and condensed ; it felt tough like leather, and was in some parts as thick as a double fold of writing-paper, and was easily raised from the subjacent matter. It appeared to be wanting over the surface of the *corpora striata* and the *thalami nervorum opticorum*, and to be thickest in the *posterior cornua.* The *corpora quadrigemina* were also very firm, and their outer *lamina* felt like that of the ventricles. The pineal gland, and also the pituitary, contained several grains of sand of a pink colour. The *cerebellum* was also preternaturally firm ; but the same degree of morbid change did not exist in the fourth ventricle as in the lateral.

Thorax.—The lungs were quite sound, and were free from adhesions. The *pericardium* contained about three ounces of serum. The heart was sound, and also the valves and large blood-vessels.

Abdomen.—The *peritoneum* was thickened throughout its whole extent, and covered with small white granular bodies about the size of large pins' heads. The *omentum* was morbidly increased in size, of a dark red colour, and very much condensed. It adhered to the *peritoneum* at many points, and was drawn somewhat towards the left side. The arch of the colon was enveloped in it, and was much out of its usual place, being considerably below the *umbilicus*. It appeared to have been dragged down by the *omentum*, which was adhering to the *peritoneum* all round the arch of the *pubis*.

The *omentum* adhered to the intestines at numerous points, and they were adhering to each other. They were generally of a dark red colour; and throughout their surface were many spots, from the size of pins' heads to that of split peas, of a dark blue colour, and slightly softened, as if indicating incipient mortification. The liver was covered with many granular bodies of the same character as those on the *peritoneum*, and its substance was rather softer than usual.

The spleen appeared sound. The mesentery was much thickened, and its glands much enlarged. The internal surface of the intestines presented no spots of ulceration, but was everywhere covered with viscid mucus.

17*th*. Margaret Collins, æt. 55, dark hair and ruddy complexion, short and stout-make, married, was admitted into the Asylum on the 2d January 1828. She had had typhous fever about three months before, which had left her weak and melancholy. She took no interest in her family affairs, and was in the habit of wandering from home. She had not been above a few weeks in the Asylum when she became somewhat cheerful, and began to take an interest in what was going on. She continued gradually to improve, and was dismissed on the 29th March quite well. She relapsed in the course of the summer, and was readmitted on the 21st August, but in a very different state. She was then quite delirious, talked incessantly, and swore much. She was vicious and destructive; her appetite was voracious, and she seldom slept. This state was unaccompanied with fever, and her countenance was in general pale and haggard, and but rarely flushed. She had no intervals of repose, unless what were procured by means of powerful opiates. She died on the 20th of the following January, very much exhausted and emaciated.

Examination.—Body much emaciated. The scalp was thin, and blood oozed out whilst dividing it. The skull-cap was of natural thickness, and was easily raised from the *dura mater*. This membrane, and likewise the *tunica arachnoides* and *pia mater*, appeared free from any morbid change. The sinuses were loaded with blood, and the brain felt preternaturally firm throughout its whole substance, and cut like a piece of cork.

No serum was found in the lateral ventricles, but their lining membrane was somewhat thickened. The *cerebellum* was also preternaturally firm, but not to the same degree as the brain. The *medulla oblongata* and beginning of the spinal marrow were very firm. The blood was very fluid, and flowed from the sinuses in great quantity, particularly on lowering the head.

The *viscera* of the *abdomen* and *thorax* were to all appearance quite sound.

18*th*. Elizabeth Collie, æt. 62, dark hair, and swarthy complexion, stout and short-make, unmarried, had been for many years subject to paroxysms of periodical insanity, and her mind in consequence was very much impaired. For the last two or three years of her life she had had no attack, but was in general calm and harmless, though easily irritated. She died suddenly of apoplexy on the 13th October 1828.

Examination.—The neck was very short. The face and head one livid mass; much blood oozed out on dividing the scalp. The skull-cap was of natural thickness, but the membranes were highly congested. There was no effusion between them. The convolutions were in close contact, and the surface of the brain presented rather a singular appearance. It looked compressed, smooth, and glossy. The substance of the brain was of natural firmness on its upper and outer part; but on slicing it down to come at the ventricles, the left was reached sooner than was expected, and a considerable quantity of effused blood escaped. On laying open both ventricles, they were found to contain about four ounces of blood. The walls of the left were very much softened, and in a state approaching to *ramollissement*. Those of the right were also very soft, but in a less degree. On the left side this morbid softening extended to the base of the brain. The *cerebellum* was also preternaturally soft. The arteries were larger than usual, and in the course of the *choroid plexus* there were several globular vesicles as large as garden peas distended by limpid fluid.

Thorax.—In the right cavity was found a considerable quantity of blood, fully half a pound. The right lung was gorged with blood, but in other respects apparently sound. The left was free from any morbid change. The heart was large and soft, and there was no blood in any of the cavities.

Abdomen.—The *viscera* of the *abdomen* were all in a sound state.

19*th*. James Tait, æt. 60, fair complexion, tall and slender make, unmarried, had been many years insane. He supposed himself to be possessed of immense wealth, and was constantly talking of the great quantities of all kinds of goods that were coming to him from all quarters. His mind was generally impaired, but he was harmless and tractable. His health for some months previous to his death had been gradually giving way. He died on the 25th of February 1829.

Examination.—Body much emaciated, scalp very thin, and easily separated from the *pericranium.* Considerable difficulty was experienced in sawing through the skull, which was found to arise from its being very much increased in density and thickness, so as to feel in a great measure like a piece of iron. The skull-cap was easily raised from the *dura mater*, and this membrane, which was very much thickened, had little or no connection with the *cranium*, except by an occasional slight attachment in the course of the superior longitudinal sinus. The *tunica arachnoides*, *pia mater*, and the brain itself, seemed to be free from any morbid change. The *viscera* of the *thorax* and *abdomen*, with the exception of a partial induration of the upper part of the right lung, were quite sound.

20th. John Dickenson, æt. 40, fair complexion, middle stature, slender-make, unmarried, a bookseller, was admitted into the Asylum on the 17th December 1828. He had been insane for seven or eight years, and became so after failure in business. When admitted, his mind was much impaired; he believed himself to be the *Holy Bible*, was frequently in the attitude of prayer, and was constantly repeating the 38th Psalm. On looking at this psalm, it will be seen that the supplicant is labouring under some severe and loathsome disease, which was the case with poor Dickenson; for, in addition to his mental malady, he suffered from a severe affection of the urinary organs.

I may observe here, that this case affords a striking example of the general inconsistency of lunatics; for at the time that he believed himself to be the Holy Bible, or God Almighty, he was constantly in the exercise of supplication and prayer. He sunk on the 19th November 1830, after a period of long and severe suffering.

Inspection.—Body much emaciated.

Head.—The scalp was slightly adherent to the *pericranium.* Having removed the skull-cap, which appeared natural as to thickness and density, the *dura mater* was observed thickened, particularly on its vertical part. Its inner surface was lined with a thick coating of coagulable lymph, having the appearance in a great measure of an adventitious membrane. Under the arachnoid coat there was considerable gelatinous effusion, which was also observable between the convolutions of the brain. The *pia mater* and *arachnoid* were much thickened, and the vessels of the latter were much congested. On the superior surface of the brain, and just at the edge of the hemispheres, there was a number of small white granular bodies.

The brain throughout was natural as to density, but it was rather exsanguineous,—few red points being observed upon its incisions. The ventricles contained no serum; and there was none under the *tentorium*. The *cerebellum* exhibited no morbid change.

Thorax.—The *viscera* of the *thorax* were sound.

Abdomen.—The liver was enlarged and granular. The gall-bladder was small; it contained no bile, and was completely filled by two gall-stones, each about the size of a common hazelnut. The stomach and intestines were sound.

The kidneys were very much enlarged, particularly the left, which was about four times its natural size. There was no induration, but the *pelvis* was dilated into a large sac, full of urine. The uriniferous tubes and *papillæ* were also much distended. The substance of the kidney contained a considerable quantity of a puriform fluid. The right kidney was enlarged to about three times its natural size; the enlargement taking place chiefly in the *pelvis*, *papillæ*, and uriniferous tubes. When laid open no purulent matter was found in its substance.

The bladder was very much diseased. It was thickened, hard, and contracted,—so much so as not to be capable of containing an ounce of fluid. The coats in some parts were fully an inch thick, and the inner surface was very irregular, being studded with hard grey-coloured matter, semiglobular in shape, irregular in surface, covered with a greenish coloured purulent matter, and presenting when divided a lardaceous aspect and consistence, with a dirty ashen colour.

Several fistulous openings in the *perineum* and *urethra* were found.

(To be continued.)

Art. VIII.—*Report on the Cases treated during the Course of Clinical Lectures, delivered at the Royal Infirmary in the Session* 1832–1833. By David Craigie, M.D., F.R.S.E., Fellow of the Royal College of Physicians, Edinburgh, Physician in Ordinary to the Royal Infirmary, and Lecturer on the Practice of Physic.

The second course of Clinical Lectures delivered by the ordinary physicians of the Royal Infirmary was commenced by my late colleague, Dr James Craufurd Gregory on the 15th November 1832; and, as my own course of Lectures on the Practice of Physic, with my other professional duties at the Hospital and elsewhere, abundantly engrossed my time and attention, and had therefore compelled me to decline joining him in this course, it was the intention of that gentleman to have continued and completed the course himself. His illness on the 15th December, however, early threw on me the performance of his hospital duty; and the unexpected fatal termination of the illness on the 26th, eventually left no alternative but that of completing the course of clinical instruction which he had commenced, which, with this view, was accordingly resumed by me on the 4th of January 1833.

These explanations are rendered requisite by the circumstance, that, in the present Report, I shall refer not only to cases which came under my own observation and treatment while performing strict clinical duty, but to others which I had previously occasion to treat in the wards under my own care; and also to a few which, having previously been under Dr Gregory, afterwards came under my management.

In the present Report, I shall confine my attention principally to those cases of acute or chronic disease which were treated in the Wards No. 6 and 13; and I shall reserve the consideration of the cases of fever to a future opportunity, unless where they illustrate some of the forms of disease occurring among the miscellaneous class. It is also requisite to observe, for those readers who are not acquainted with the internal arrangements of the Royal Infirmary of Edinburgh, that each physician, whether clinical or ordinary, has under his care two wards,—one for the admission of patients affected with fever, small-pox, or similar contagious diseases, and one for patients labouring under all other diseases.

In order to communicate some idea of the diseases most usually coming under treatment in the Royal Infirmary of Edinburgh, I may subjoin the following tabular list of the cases which were admitted into the wards now specified between the 15th December 1832, and the beginning of August 1833.

	F.	M.
Meningitis, subacute or chronic,	1	3
Encephalo-meningitis tremefaciens, sive (*Delirium tremens*),		3
Hemiplegia,	3	2
Paraplegia Myelilica,	2	
Local palsy,	1	
Chorea,	1	
Cynanche tonsillaris,	2	
Laryngitis,	2	1
Aphonia,	1	
Bronchitis, without or without *Emphysema pulmonum*,	10	2
Influenza,	22	9
Pneumonia,	2	1
Peripneumonia notha,	0	2
Pleurisy,	3	1
Pulmonary consumption,	5	3
Pericarditis,	1	1
Diseases of the heart,	10	
Aneurism of the aorta, with enlargement of the bronchial tubes of the right lung,	1	
Dyspepsia,	5	
Chronic congestion of the liver, producing jaundice,	3	1
Peritonitis,	4	1
Dysentery,	2	
Melæna,	1	
Gastro-enteric hemorrhage,		1
Cirrhosis of liver,	2	1

	F.	M.
Disease of the kidneys, including *cirrhosis* in various stages,	6	
Vesical catarrh,	1	
Corroding ulcer of the womb,	1	
Amenorrhœa,	6	
Leucorrhœa,	4	
Prolapsus uteri,	1	
Tubercles of the peritoneum, with tumour between the stomach and transverse arch of the colon,	1	
Anæmia hemorrhagica,	1	
Rheumatism,	11	
Fever, continued,	3	101
Fever, intermittent,	1	1
Erysipelas,	10	
Small-pox,	3	5
Ophthalmia corneæ et scleroticæ,	1	
Iritis,	3	
Ophthalmia tarsi,	1	
Ophthalmia chronica cum nebulis,	1	
Ulcerative inflammation of the gums,	1	
Periostitis and *Ozæna,*	1	
Periostitis,	3	1
Chronic cutaneous affections,	7	3

In the following observations, I do not propose to notice all the cases; for that would be a task at once tedious and unprofitable. I shall merely select for particular observation those which are remarkable, either as they illustrate some useful pathological or therapeutical principles; and in this selection, also, I shall be guided by the facility with which, in uncertain cases, my own views of their nature were elucidated, either by treatment in the case of recovery, or by the morbid appearances in the case of death. I shall at the same time not adhere strictly to the details even of important cases; but make them the subject of such observations, pathological and therapeutic, as I had occasion to advance when they formed the subject of clinical instruction.

Of the cases of *Meningitis*, three terminated fatally, and one recovered.

The first of the unfavourable cases was in various respects interesting. It occurred in the person of Alexander Rutherford, aged 36, a house carpenter, resident at Dalkeith. This man, originally in the employment of the Marquis of Lothian, had been affected with symptoms of dysentery, for which numerous leeches were applied to the belly. By the use of these and other remedies he appeared to have recovered, but not sufficiently to enable him to work at his occupation, and his place was consequently given to another about November 1832. Soon after he began to exhibit marks of extreme despondency and anxiety. In the course of December this was accompanied with loss of memory and incapacity to employ his tools in the usual way with any definite object. After being for some time under the care of Dr Graham of that town, he was sent to the Infirmary on the 12th March, complaining chiefly of constant pain of the hypogastric region. He had at the same time a stupid fatuous look, and could give no distinct account of his feelings, unless the pain referred to, and incapacity to swallow, in consequence, as he said, of the extraordinary size of his tongue.

It is almost superfluous to observe, that this organ, as well as the throat, were quite natural, and that the idea was a mere hallucination. The pulse varied from 68 to 76.

The treatment consisted in shaving the head, and applying the cold affusion in order to allay his restlessness; detraction of blood from the occipital and frontal regions; evacuation of the bowels by means of the compound colocynth pill and calomel, alternated occasionally with the oil of turpentine, and doses of tartrate of antimony, varying from six to ten grains, in order to abate the congestion of the encephalo-meningeal capillary system, alternated with opium. Under the use of these means he underwent a slight amelioration, in being less violent and restless. But the mental disorder remained unabated. His recollection of past events appeared entirely obliterated, and he was quite absent, and seemed unable to comprehend any question put to him, sufficiently to give a rational reply. He took a singular fancy of not emptying his bladder for a series of twenty-four or thirty hours, in consequence of conceiving himself unable to do so; yet when the catheter was introduced, it was manifest, by the energetic expulsion which he exhibited, that there was no loss of power. Two or three times he retained his urine in this manner, until six pounds were accumulated and withdrawn by the catheter.

When this hallucination about his inability to make water was subverted, he still obstinately maintained that his tongue was too large, and prevented him from swallowing his food. Latterly, he became listless, averse to be disturbed, and unwilling to take food of any kind. The symptoms of general weakness obliged me to allow him wine and nutritious diet. But he died on the 9th of April.

Upon inspecting the body, the following appearances were found. The arachnoid membrane was perfectly opaqüe, and actually elevated with the quantity of serous fluid effused into the subarachnoid tissue. In some parts there were spots of opaque, white, irregularly-shaped matter, evidently coagulated albumen. The granulations of the *pia mater* were also large, opaque, and firm; and the membrane itself was vascular and extremely thick. The convolutions were flattened, indicating that the substance of the brain had been forcibly compressed against the membranes and inner table of the *cranium*. The brain itself was unusually firm, and highly vascular. The *pia mater* over the cerebellum and annular protuberance was also very vascular and thickened. Abour five or six drachms of serous fluid were found in the cerebral cavities, and the choroid *plexus* was dark red and vascular.

The heart and lungs were free from disease. The mucous membrane of the stomach was loaded with mucus, on the removal of which, it was seen to be vascular, in patches, and minute arborescent figures. Towards the pyloric extremity, at one part the mucous membrane was abraded in a minute spot; and in the beginning of the *duodenum*, there were two bloodshot abraded spots. The mucous membrane of the *ileum* and colon were quite natural.

In the second fatal case, the symptoms of mental derangement had come on about two years before, but had subsided under treatment in the Lunatic Asylum. The symptoms were now incoherence, loss of recollection, and constant restlessness and incapability of restraining or commanding his motions, as in *paralysis agitans* and *chorea.*

It was recommended to his wife to have him removed to the Lunatic Asylum; but some difficulties interfered. He refused almost all remedies except shaving the head; and the occasional use of purgatives and tartrate of antimony; and nothing almost was done. He died on the ninth day after admission; and upon inspection, the arachnoid was found elevated by infiltrated serum; the convolutions flattened; the cerebral substance injected, and some serous fluid in the ventricles.

The third fatal case occurred in the person of Jane Noble, a woman of at least 60, but who stated herself to be only 48. She had been long habituated to the use of ardent spirits; and about three weeks before her admission, she had exhibited symptoms of incapacity to perform any of her usual duties, and even to take her food, and dress or undress herself. Upon admission, 11th July, she could give no rational account of herself, and made no complaint, unless of some dull headach, and incapacity to walk or stand. She could, however, do both with assistance, and she could move her limbs, though slowly, and not very steadily, in any direction she was desired. Recollection and attention, however, were much impaired, and she was completely absent, and was unable to comprehend or answer questions.

The only treatment was shaving the head, detraction of blood by leeches and cupping, blisters applied to the scalp, purgatives, and occasional opiates. The symptoms of mental disorder, however, did not improve. She could never be brought to empty her bowels or bladder any other way than in bed. She exhaled a constant fetid urinous odour, so as to annoy the neighbouring patients extremely; and after continuing in a state of listlessness and apathy for several days, she became lethargic, the pulse became extremely quick, the skin hot and moist, and she lost the power of swallowing, and died on the 30th of July. About twenty-four hours previous to death, a large, soft, elastic tumour appeared on the *occiput*, and another on the back of the trunk, near the inferior angle of the left *scapula.*

Upon inspecting the body, the following appearances were found. The shape of the *cranium* was peculiar, being bulged, oval all round the upper margin, flattened above, and narrow below. The arachnoid membrane was elevated by a considerable quantity of serous fluid over the hemispheres and lateral part of the brain, and at the base, near the circular protuberance. The *pia mater* was extremely vascular and injected. The convolutions of the hemispheres were also flattened, and the *sulci* less distinct than natural. The substance of the brain was natural in consistence. The ventricles, however, were extended and dilated in every direction by a quantity of limpid serous fluid, which accumulated at least to four ounces. The internal carotid, and the commencement of the circle of Willis, were opaque. A considerable quantity of the same fluid escaped from the *theca* of the spinal chord, by incipient steatomatous deposition.

The upper part of the left lung presented a hard cartilaginous mass, about the size of a small filbert; but the organ was, in other respects, healthy. The *pleura*, however, adhered to that of the ribs and diaphragm; and the two lobes were mutually adherent.

The walls of the left ventricle of the heart were thickened and hardened, and their cavity slightly contracted. The edge of the aortic valves, and the lining membrane of the aorta, were roughened by numerous points of steatomatous deposit; and similar matter was deposited at the origin of the large vessels issuing from the arch.

The *sternum* also was incurvated backwards, so as to present a remarkable convexity before, with a corresponding concavity behind.

This case forms, in several respects, the counterpart of that of Rutherford. In the case of Rutherford, the meningeal affection was chiefly confined to the external division of the membrane, and to the brain. In the case of Jane Noble, the meningeal affection was most conspicuous in the central division of the cerebral membrane; and the external division, as well as the brain, was little affected. The symptoms also corresponding to these respective states were different. Though in both there was loss of recollection and attention and complete absence, in the case of Rutherford, hallucinations were combined with restlessness and violence; while in the case of Jane Noble, the prominent symptoms were, a sort of sullen stupidity and listlessness, with great inertness of all the muscular actions.

In the fourth case, which occurred in the person of James Law, aged 39, the favourable termination took place under the use of shaving the head, depletion from the head by means of leeches, purging by the compound colocynth pill, and calomel in large doses, or calomel and croton oil, or turpentine and castor oil, the sedative and derivative effects of large doses of tartrate of antimony, and occasional opiates.

Of the cases of *Encephalo-meningitis tremefaciens*, one died the following morning after admission. This man had been attacked by the disease several times before, and seemed conscious of his danger. The cold affusion to the shaven scalp, five ounces of blood drawn from the occipital region, followed by an opiate and the calomel bolus, were the remedies employed.

The body was inspected at his own house, to which the friends removed it; and we learned, that much serum was effused in the subarachnoid tissue, and about one ounce in the ventricles.

A case deserving notice in this place, as forming a link between the last set of cases and those to be next mentioned, occurred in the person of Francis M'Ivor, an old pensioner.

With *Hemiplegia* of the left side, he presented symptoms of mental disorder in the rapidity of the flow of his ideas, his incessant loquacity, and general irregularity of conduct. There was also a slight contortion of the muscles of the right side of the face and eyelids.

The chief treatment to which he had been subjected previous to the time when I saw him, was keeping the shaven scalp cool; the occasional use of croton oil and other purgatives, and some wine.

As the symptoms and history of the case appeared to me to denote a degree of chronic inflammation of some part of the right side of the brain, or its membranes, or both, I directed several ounces of blood to be drawn first from the occipito-cervical region, then from the right temporal; the bowels to be freely opened by calomel and croton oil; and afterwards a mixture, consisting of ten grains of tartrate of antimony, in four ounces of water, to be taken in doses of half an ounce every second hour. He swallowed the whole antimonial mixture at once; and, though it produced only slight squeamishness without vomiting, it opened the bowels very freely; and the following day he was not only more rational in his conduct, but maintained that he was so able to walk, that it was quite unnecessary to keep him longer in the house.

He was, however, retained about ten days longer, in order to ascertain whether the improvement in judgment and voluntary motion was permanent. During this period, he had a slight return of the vivacity and confusion of ideas, for which, once more, blood was ordered to be drawn from the head; the bowels were evacuated by calomel and croton oil; and the sedative influence of the antimonial solution was again resorted to. After this he displayed more judgment, and had more command of the muscles of the left side; and, though he continued to drag the left leg, he went out much better than when he was admitted.

This man I lately saw in the street; and though, like other hemiplegics, he hangs or supports the left arm, and drags a little the left leg, he has evidently much more command of himself than formerly. The disease of the brain, which was then active, seems now to be brought into a state of quiescence.

Both cases of *Paraplegia* depended on chronic inflammation of the spinal chord *(Myelitis)*; and both terminated fatally.

The first case I shall mention occurred in the person of Isabella Calder, aged 35, unmarried. This woman, whose appearance was respectable and character good, had been in the Hospital about twelve months previously, with symptoms of *hemiplegia*, which had partially disappeared after treatment of some weeks' duration, but left a degree of inability to walk, in consequence of an involuntary spasmodic contraction of the flexor muscles of the thigh. Some months after she complained of a sense of weakness, and constriction referred to the lumbar region; and, about a month before admission, (*i. e.* about the 25th February 1833,) she began to complain of inability to move the left lower extremity without dragging it, and a sense of numbness from the lumbar region downwards, and also in the left iliac region. At the period of admission on the 25th March, she complained much of the involuntary spasmodic traction of the flexor muscles, which, with a sense of painful distension round the belly, was so considerable, as to disturb her nights and prevent sleep. The appetite was stated to be good, the general health not affected. The pulse, however, was from 80 to 90, the skin hot and dry, and the tongue covered with a brown dry fur. The intellectual functions were unimpaired, and the urine and feces passed naturally. The whole vertebral column bore pressure and warmth without uneasiness; and there was no deformity or change in direction.

As I was convinced, from the symptoms now enumerated, that the spinal chord or envelopes were the seat of a chronic inflammatory process, I ordered blood to be drawn from along the course of the dorsal and dorso-lumbar region of the spine by leeches and cupping, the bowels to be emptied by the compound colocynth pill and calomel, and occasionally by croton oil, aloes, and calomel.

An attack of shivering, with sickness and vomiting, succeeded by heat, quick pulse, general pains, and an aggravation of the spasmodic attacks, made me dread the accession of an acute form of the complaint, and induced me to order a general blood-letting to the amount of eighteen ounces, to be followed by a dose of infusion of senna and the saline mixture; and, as the blood was much buffed and cupped, and she bore the evacuation well, twelve ounces more were drawn in the evening; the bowels were freely opened by cathartic medicine, and blood was drawn from the ileo-lumbar region, to which much pain was referred, by means of leeches. Under the use of these agents she was less distressed with the spasmodic contractions, and she thought that she had more command of the lower extremities. Rose, which, however, all this season was prevalent in the hospital, appeared on the back and belly, and added much to her sufferings. On the 6th, she complained much of tension and constriction of the belly, the stools were passed unconsciously, and the bladder had lost its contractile power, requiring the urine, amounting occasionally to six pounds, to be withdrawn by the catheter.

These symptoms continued to the 10th, when they were aggravated by the addition of sickness and vomiting. The muscles of the lower extremity, as well as the *rectum* and bladder, did not recover any power; and, after a state of listlessness and extreme feebleness, with respiration only at eleven in the minute, yet without hiccup or insensibility, death took place on the 14th.

On laying open the spinal *theca*, there was found effused beneath it a considerable quantity of fluid highly tinged with blood, probably chiefly from divided vessels. Along the whole course of the dorsal *vertebra* the *theca* was injected and thickened, especially anteriorly. On dividing the *pia mater*, part of the spinal chord, opposite the tenth, eleventh, and twelfth dorsal *vertebræ* protruded like a *hernia cerebri*, and it was found to be extremely soft, pulpy, and of a homogeneous cream colour. This condition of the chord extended upwards to the second dorsal *vertebra*, and downwards to the second lumbar *vertebra*, diminishing in both directions gradually till it terminated in sound cerebral matter. It was most remarkable in the posterior surface, where all trace of organization was destroyed, but less so at the anterior surface, excepting at the spot opposite to the tenth and eleventh dorsal *vertebræ*, where, when removed from the sheath, it was so unable to sustain its own weight that it fell asunder.

On examining the brain, a considerable quantity of fluid was found effused under the arachnoid membrane, rendering it opaque. The substance of the brain was healthy. The ventricles were slightly distended by serous fluid; and the choroid *plexus*, and the *pia mater*, at its junction with that web, were remarkably vascular.

In the chest the right lung was generally adherent. Both were emphysematous in some degree anteriorly and inferiorly, and the superior lobes were highly œdematous, emitting frothy serous fluid in considerable quantity on each incision. The heart was natural in size and structure.

The liver was rather paler and firmer than natural. The other organs were sound. In this case the pulpy destruction of the spinal chord, which gave rise to the paraplegic symptoms, arose spontaneously, so far as could be discovered, or, at least, was unconnected with any disease of the *vertebræ.* The *theca* alone appeared to be in a state of previous chronic inflammation; but this could not have been adequate alone to induce the disease of the spinal chord. The arteries also were sound.

In the next case, we have an example of myelitic *paraplegia* depending on disease of the bodies of the *vertebræ.*

It took place in the person of Isabella Meldrum, a widow, aged 53, following the occupation of a washerwoman. About five or six months before, she had fallen down a flight of stairs, and lighted on her back. This accident attracted little attention at the time. But about the close of January 1833, she was affected by tingling sensations, with numbness in the limbs, while her general health was enfeebled by dyspeptic symptoms. The tingling sensations continuing, she was attacked, in the course of two weeks more, by severe pains of the epigastric and right lumbar region, with great general feebleness and partial loss of motion and sensation of the lower extremities, beginning first in the feet and toes, and extending upwards. When these symptoms had continued about two weeks, the feet became œdematous and cold; and constipation was followed by involuntary discharge of the feces, while the bladder becoming over-distended, lost its retentive powers. The constant trickling of urine in this manner had produced large sloughs over the *sacrum,* while the application of excessive warmth to the insensible skin of the feet had been followed by several bad sores. In this state she was admitted on the 24th March, with the *abdomen* much distended and tympanitic, sensation almost gone below the epigastric region, the feet and legs œdematous, the temperature rather above natural, the hypogastric region painful, and the urine incessantly trickling from the bladder.

By the frequent use of the catheter, the bladder recovered much of its power, and she was made comparatively comfortable. The bowels were opened by calomel and colocynth, with the aid of occasional enemata; blood was drawn from the region of the spine by means of leeches; powders consisting of supertartrate and nitrate of potass, and carbonate of soda, with aromatic powder, were given to act on the kidneys; a light but nutritious form of diet was directed; and to the sloughs on the back and sores on the feet poultices and the warm dressing, or the resinous ointment, were applied.

Under these measures, I. Meldrum became greatly more comfortable, and recovered some sense and motion of the limbs; the urine became copious; the œdematous swelling of the feet subsided; and the tympanitic sensation of the *abdomen* abated. It was very soon observed, however, by the constant weight and pain in the hypogastric region, with the turbid, clouded, fetid urine, that she was labouring under catarrhal inflammation of the bladder. The thirst continued unquenchable, the tongue dry and brown, the pulse never below 112, and the skin hot and dry; and after languishing for two weeks more, notwithstanding the use of appropriate remedies, with such articles of nourishment and wine as she could take, she died on the 25th April.

The following appearances were found.

At least one ounce of serous fluid was found within the *theca* of the spinal chord. When this was laid completely open, the chord was found pale, and of a dead white colour, and as soft as thick cream, first at a part corresponding to the eleventh and twelfth dorsal *vertebræ*, where it broke down completely and was void of organization. Upwards from this the chord was softened as far as the seventh cervical, and downwards as far as the second lumbar *vertebra;* and through the whole of this extent it was of the consistence of thick cream of a dead white colour, and without marks of fibrous structure. The eleventh and twelfth dorsal *vertebræ* were on their posterior surface denuded of *periosteum*, and presented a quantity of granular matter, on removing which the *cancelli* were exposed and somewhat softened and carious. The intervertebral cartilage, between the first and second lumbar *vertebræ*, presented a globular excrescence about half an inch in diameter and one-fourth in elevation. There was another smaller one between the second and third lumbar *vertebræ*. On opening the *thorax*, five of the dorsal *vertebræ* were found covered on the right side by an oblong cyst containing pulpy matter of an atheromatous appearance and consistence. On removing this cyst, the bodies of the *vertebræ* were found deprived of *periosteum*, and their cancellated texture exposed.

The convolutions of the brain were much softened, and a considerable quantity of serous effusion was found in the subarachnoid tissue. The substance of the brain was softened, and the ventricles contained some serous fluid.

The upper extremity of the left kidney was closely adherent to the diaphragm and spleen; at the inferior part was an abscess containing tubercular granular matter, which was found on dissection to communicate with the *pelvis*. Several of the *calyces* were enlarged, and contained similar matter. The *ureter* was dilated and thickened, and its mucous membrane inflamed and roughened on the surface.

In the right kidney the *pelvis* was also dilated, and its mucous membrane thick and roughened. The *ureter* was also enlarged and thickened.

The coats of the bladder were much thickened, its mucous membrane of a bluish colour, irregular, and covered with bloody patches. The dimensions of the bladder were much contracted.

These two cases illustrate remarkably a general fact observed in the approach of palsy, especially when it depends on a progressively advancing disease of the central parts of the nervous system. In both, the accession of the symptoms was marked by painful involuntary spasmodic contractions of the flexor muscles. This indicated, not that the nerves of the flexor muscles were most affected, but that those of the extensors were already diseased so far as to have lost all control over the muscles. In consequence of this, with the disturbed action at the central ends of the nerves generally, the inherent irritability of the flexor muscles gives rise to spasmodic contractions. This phenomenon is not observed when the injury or disease is so great as to extinguish suddenly all sensation and motion, but only when it advances so slowly and progressively as to pass through successive stages to the final result.

The case of local palsy occurred in Caroline Fergusson, a girl of 15. It presented a mixed character between that of *Chorea* and *Paralysis agitans.* It was chiefly evinced in incapacity to carry by the right arm a vessel steadily to the head, unless by an unsteady vibratory sort of motion, or to use the hand and fingers with much precision. Leeches and blistering over the origin of the brachial *plexus* in the neck; shaving the head, with leeches to the temples, and evacuation of the bowels, abated the most prominent symptoms, and certainly enabled her to employ her fore-arm, hand, and fingers, with more precision than formerly, but did not completely restore their use. She was dismissed by her own desire.

The case of *Chorea,* (Mary Baillie, aged 11, admitted 31st December 1832,) was extremely well marked. The motions were incessant, and uninterrupted almost night and day; and the patient had no command whatever over the voluntary muscles. Though the bowels were at first freely evacuated and discharged much scybalous feces, the head was shaved, and that and the spine carefully inspected, in order to exclude the chance of any cause affecting the central part of the nervous system being overlooked. No cause of this kind was recognized; and though blood was drawn from the cervical region by leeches, and the cold affusion was employed as an instantaneous sedative, the treatment was conducted on the idea that the cause of the motions was seated in the alimentary canal.

As the bowels were torpid, and not easily affected by the ordinary purgatives, in the usual doses, I found it requisite to vary them from day to day. The most efficient purgative was a mixture consisting of three drachms of oil of turpentine, and half an ounce of castor oil, with thirty drops of *aqua ammoniæ*, so as to form a saponaceous emulsion. This produced, with a little sickness, four copious feculent stools, the discharge of which was followed by evident abatement of the motions, and a much quieter night. It was repeated the same day with the effect of evacuating four stools, with several scybalous indurated masses,—after which she had some command over her muscles, and became more manageable. Two days after, an ounce of oil of turpentine was injected into the colon, with the effect of expelling scybalous and indurated feces; and the morning after, when these were believed to be nearly eliminated, she was ordered some calomel and jalap. By persevering in this manner for several days more, this child became quiet, manageable, and rational; the appetite, which had been originally ravenous, became more moderate; her countenance and eyes were more settled and steady; and, with complete command over her limbs during the day, she spent quiet nights in sound and undisturbed sleep. The motions first abated on the 6th January; on the 15th they were entirely gone; on the 18th she was in the state now described; and next day she went home with some medicines and directions for their use.

The cases of *Cynanche* presented nothing peculiar.

Of the cases of *Laryngitis*, one was subacute, the other chronic. The latter, which occurred in the person of Mary Fraser, a woman of 54, admitted on the 27th of June, was, so far as could be discovered, of syphilitic origin. It was associated with a cutaneous eruption, of flat orbicular copper-coloured spots, most abundant round the margin of the scalp, and an attack of iritic inflammation. Though treated by local bleeding, blisters, inhalation of hot steam, purgatives, and calomel, the feeling of difficult and painful laryngeal breathing, and the hoarse sibilous voice, continued little ameliorated. The *epiglottis* was unaffected. The scalding lacrymation, intolerance of light, and pink-coloured vascular zone disappeared, and the *cornea* became quite clear under the use of local bleeding, shaving the head, and the constitutional influence of calomel.

After the disappearance of these symptoms, however, she was attacked by rose of the leg and foot, with much swelling. This was treated by purgatives, local depletion by means of numerous punctures, poultices, and afterwards the tight bandage; and had disappeared in about eight days. The laryngeal affection, however, continued, and now gave rise to such difficulty of deglutition, that she could take no solid food, and required to be nourished by beef-tea, arrow-root, and wine. Notwithstanding this, however, her strength continued to decline, and she died on the 23d July. Inspection was not permitted.

Of the cases of *Bronchitis*, nine recovered, and six died.

The remedies under which recovery was most readily effected were, blood-letting from the arm to the amount of sixteen or eighteen ounces, followed by the detraction of blood from the chest between the shoulders, by cupping or leeches, or both, or from the anterior part of the windpipe by leeches, blisters between the *scapulæ*, and a mixture of squills and antimony, with opiates. In some I found a powder consisting of one drachm of supertartrate of potass, half a drachm or a scruple of carbonate of soda, and ten grains of nitrate of potass, of great use in cases in which there was reason to apprehend, from the scantiness of the urine, that the disease was passing from the bronchial membrane to the submucous tissue, and beginning to affect the circulation of the lungs.

In several cases of the chronic disease, I tried the tincture of the *Lobelia inflata*; but in one only, in which other remedies were also used with benefit, did it seem to be productive of advantage.

In cases of chronic *bronchitis* of aged enfeebled subjects, with excessively profuse secretion of frothy mucous fluid, I found acetate of lead and opium, in doses of three or four grains of the former to half a grain of the latter, three times daily, of much use. This remedy required to be alternated with the use of the compound colocynth pill, or a small dose of castor oil every second or third day, according to circumstances, in order to obviate the effects of constipation.

Another agent equally powerful, and not so liable to injure, in the treatment of chronic *bronchitis* with profuse secretion, I found to be sulphate of zinc, with extract of *hyoscyamus* or opium. in doses of one or two grains of the former, to two or three of extract of *hyoscyamus*, and half a grain of opium. This remedy was very useful in the case of Elizabeth Meek.

Its effect is not merely to check undue secretion by its astringent power, but, by operating on the capillaries generally, and those of the bronchial membrane in particular, it tends to restore their natural properties, and propel their contents in the proper channels.

In speaking of the chronic form of *bronchitis*, I may take occasion to rectify several erroneous notions which I find prevalent on the subject of pulmonary *emphysema*. Ever since the publication of the work of Laennec, in which this variety of lesion received a distinct place and consideration, it has been too much the practice for teachers to represent, and students to regard, pulmonary *emphysema* as a primary lesion, and thereby to overlook entirely its true character, and its anatomico-pathological relations. Every case almost of *dyspnœa*, and almost all cases of what are commonly called *asthma*, have been since that time attributed to *emphysema* of the lungs; while the formation of *emphysema*, and the mechanism of its production, have been very much, if not entirely, overlooked. I have long and repeatedly had occasion to observe, and to impress on the hospital-pupils, the fact, that *emphysema* is one only of many effects of the chronic form of *bronchitis*, and that it is only at a particular stage of the latter affection that the emphysematous distension takes place.

In the early stage, indeed, of *bronchitis*, there is simply a diffuse or spreading inflammation or congestion of the pulmonary mucous membrane, and after it has subsided under proper treatment, that membrane, both where it lines the bronchial tubes and pulmonary vesicles, sooner or later returns to its natural condition; while the calibre of these tubes, and the capacity of the vesicles, is little or not at all lessened. Either, however, after repeated attacks or long continuance of this disease, not only does the inflammatory process extend from the mucous membrane to the submucous or pulmonary filamentous tissue, but by its long endurance it renders the former thick, villous, and brownish-coloured, secreting either much viscid mucus, or mucus more or less tinged with blood, or even occasionally pure blood, and indurates and solidifies the latter by the extravasation of albuminous fluid; while the increased thickness of the membrane, and the swelling of the submucous tissue, encroach so much upon the area of the bronchial tubes and vesicles, as to diminish remarkably the capacity of these cavities.

This swelling, however, of the pulmonary mucous membrane and filamentous tissue is not general over the whole of the tubes, nor even over the whole of one tube, otherwise it would produce fatal *asphyxia*. But it in general takes place at certain spots in the course of the tubes more remarkably than at others, producing a species of stricture of one or more bronchial tubes in one or both lungs. The effect of this again is various, according to its degree, and according to the component systems and textures of the lung most affected. One of the most frequent effects of the presence of one of these constricted portions, especially if the membrane secretes much viscid mucus which requires to be frequently coughed up, is to obstruct the passage so much that expiration becomes either inadequate or is interrupted. As respiration consists, therefore, in alternate inspiration and expiration, if air has been either inhaled by this tube, or by some of the communicating ones, it cannot, during ordinary expiration, be easily expelled. The effect is, that the bronchial membrane and pulmonary vesicles are excited by their physiological properties to frequently repeated expiratory efforts; and as these are inadequate to expel the air from the lungs, the compression of the expiratory muscles necessarily, by forcing the portion of lung into smaller compass, compresses the air already contained in the vesicles beyond the constricted point. The air thus confined, after many repeated expiratory efforts, forces its way, by its own elasticity, through the delicate mucous membrane of the vesicles into the pulmonic filamentous tissue, and, when once there, it continues to spread rapidly in proportion to the obstruction in the bronchial tubes, and the difficulty of producing efficient expiration. It is then that the air contained in these vesicles renders the chest, when struck, preternaturally resonant; while the extreme difficulty of breathing, with the dry sonorous *rhonchus* or sibilism, indicate the laborious struggle which is made in the tubes, contracted by swelling, and obstructed, as they are, by adherent mucus,—to inspire and to expire in an efficient manner.

In this manner, therefore, bronchial inflammation, either by continuance or repeated attacks, tends to produce *emphysema* and its usual phenomena; and there are few cases of emphysematous distension of the pulmonic filamentous tissue which may not be traced to this cause. In the young, when labouring under hooping-cough, in the aged, after frequently repeated attacks of catarrh, and in the middle-aged after the continuance of bronchial inflammation, in a subacute or chronic state, *emphysema* is with equal certainty, and in equal perfection, produced. In the first case, indeed, as the bronchial symptoms subside, the tubes become more pervious, and expiration becomes so much freer and less interrupted, that the air ceases to be urged through the vesicular membrane, and that which had been already impelled into the pulmonic filamentous tissue is at length absorbed. But in the two latter instances, in which the thickening of the membrane either abates little, or continues unchanged, the emphysematous distension continues to increase, until it has attained an extent almost incredible to those unaccustomed to examine cases of chronic bronchial disease.

Emphysema, however, is not the only effect of this state of the bronchial tubes. The impracticability of inspiring and expiring completely in such a state of the lungs, which implies the absence of the most essential condition of respiration, viz. the frequent and incessant change of air in the bronchial tubes and vesicles of the lungs, interferes with the necessary changes in the blood of the pulmonary artery and veins, which, therefore, passes from the former vessel into the latter, much less completely aërated than it would be in the healthy state. In addition to this, as the motion of the blood through the pulmonary artery into the pulmonary veins is always more free, in proportion as the expansion of the lung by inspiration, and its collapse by expiration, is extensive; and as both the obstruction of the bronchial tubes by viscid mucus, and the swelled and congested state of the bronchial membrane and submucous tissue, prevent the branches of the artery and veins from freely expanding themselves, the motion of the blood through this order of vessels begins to be interrupted and retarded, and thus to induce a congested state of the whole pulmonary system, which not only adds to the *dyspnœa* and *orthopnœa* of such patients, but eventually terminates in dropsical effusion into the pulmonic filamentous tissue, into the cavity of the *pleura*, and even into the general cellular membrane. The pulmonic filamentous tissue is in general the first seat of this dropsical infiltration; and it is one of the most common changes recognized in inspecting the lungs of persons cut off by long-continued bronchial inflammation.

Chronic bronchial inflammation, further, by its influence in impeding respiration and the circulation of the pulmonary artery and veins, has an indirect tendency to induce disease of the heart. In consequence of the difficulty which the blood encounters in passing through the branches of the pulmonary artery, the trunk of that vessel becomes permanently distended; and the right ventricle, being also distended and incessantly excited to new contractions, becomes affected with hypertrophy, sometimes with dilatation, sometimes without; and in other cases it may be merely enlarged with extenuation of its walls. It is, I conceive, in consequence of the union of the two ventricles in the human subject, that this excessive distension and inordinate action, by being first confined to the right ventricle, gives rise to a similar inordinate action in the left ventricle, that the latter is often found in a state of hypertrophy in persons who have long laboured under chronic bronchial disease. The fact of the connection is at least well-established; and the wards presented few instances of bronchial disease in which the heart was not affected, and in most of the cases of disease of the heart, the bronchial membrane and pulmonic tissue had been previously affected.

These considerations on the pathology of this disease, and the true character of pulmonary *emphysema*, were amply confirmed by several cases, both favourable and fatal, which fell under observation. I shall only select, however, the case of Margaret Broadley, as one which, in the unequivocal nature of its symptoms during life, and the appearances after death, is most deserving attention.

This woman was admitted on the 4th February, with difficult and laborious breathing, frequent cough, aggravating much a painful sensation at the epigastric region, palpitation at intervals, and weak small pulse at 120 in the minute, with tendency to coldness of the extremities. The respiration was thirty-two in the minute, with much heaving of the chest and irregular motion of the *diaphragm*. The chest sounded preternaturally clear all along the back and sides, but rather duller under the *axilla*. Vesicular respiration was nearly inaudible, but bronchial respiration, with deep sonorous *rhonchus*, mixed with subcrepitous rattling and occasional sibilism, was distinctly heard in the central region of both lungs. The action of the heart, though not violent, was heavy, labouring, and jarring, with considerable pulsation in the epigastric region. The countenance, and especially the lips, was bloated and livid; and she continued to lie in the prone position. The urine was not above twelve ounces daily, and the bowels were habitually constipated.

The treatment consisted at first of emetic doses of tartrate of antimony, local bleeding from the chest by means of leeches, with evacuation of the bowels; then slightly nauseating doses of tartar emetic, camphor mixture, and the combination of carbonate of soda and nitrate of potass to act on the kidneys; and latterly small quantities of wine and water, or gin toddy. Under the use of these means the symptoms were mitigated; but the leading features of the disease remained the same. All remedies, indeed, were unavailing. Independent of the circumstance, that the disease had been of seven or eight months' duration, during which it had been aggravated by every species of mistreatment, the habits of the patient,—a public woman, addicted to the habitual use of ardent spirits,—were extremely unfavourable to the properties of the tissues recovering their energy. She died on the 15th.

On exposing the lungs, they presented the appearance as of having been compressed by the thoracic *parietes*; and the right, instead of collapsing as usual, protruded considerably. The left lung, though equally diseased, was retained in its position by numerous adhesions of old formation. The air vesicles were seen through the *pleura* to be much dilated; air was extensively effused into the pulmonic filamentous tissue all over the lower region of both lungs; and in several places the *pleura* had been elevated into prominent spheroidal and ovoidal bags, on the surface of the lung at its inferior margin. Some interlobular *emphysema* was also observed at the lower and anterior margins of both lungs. The lungs were throughout, especially at their superior and central parts, much more solid than natural, and were much less crepitating, and quite unsusceptible of general inflation. The filamentous tissue was every where dark-brown, firm, and discharged bloody serum freely when cut; but, on the posterior and depending part of the lung, there was less vascular congestion than common, and the vicinity of the emphysematous portions was pale and bloodless. Several of the bronchial tubes were dilated in some points, and contracted in others. The mucous membrane of all was highly injected, of a red-brown colour, villous, and covered with a thick tenacious bloody mucus, which in many completely plugged and obliterated the smaller branches. In the tubes proceeding to the emphysematous portions, this obstruction was perfect; and, when the mucus was removed by washing, the membrane was found to be much thickened in small spaces, about one-sixth or one-fourth of an inch, so as to diminish considerably the area of the tube.

The heart was large, but was not distinctly dilated or hypertrophied. The mitral valve presented one or two thickened points of cartilaginous hardness.

The semilunar valves were healthy; but immediately above them, and all along the course of the *aorta* at the origins of the vessels, there was a broad thin deposition of an albuminous nature effused under the *tunica intima.*

Abdomen.—Liver somewhat enlarged; its substance paler and firmer than usual; stomach and intestines all healthy, with the exception of some hardened points resembling cicatrized ulcers. Other *viscera* healthy.

The appearances now enumerated are those of many similar cases of subacute or chronic bronchial disease; and in all the process tends, with more or less certainty and different degrees of rapidity, to produce stricture and obstruction of the bronchial tubes, and subsequent *emphysema* of the lungs. At this point the process is sometimes suspended for a series of months or even years. After the bronchial membrane has been thickened, and even the submucous tissue consolidated, the process advances no further, and the patient may enjoy a certain degree of health, accompanied, however, with shortness of breath and a dry cough. These are the cases of chronic *dyspnœa,* popularly called asthma, which occasionally undergo, under favourable circumstances of weather, &c. such alleviation and improvement, as to leave merely a degree of breathlessness, augmented under the influence of meteorological changes, or causes which disturb digestion, or alter the state of the venous circulation. The swelling of the bronchial membrane, and the constriction of its calibre remain, though in a passive state, and are merely liable, under certain circumstances which alter the circulation and overload the venous system, to undergo temporary aggravation; and in this manner occasionally to induce symptoms of spasmodic asthma.

The stethoscopic signs of this state are excessive resonance of the chest approaching to tympanitic sound, deep grating sonorous *rhonchus* with sibilism, and indistinctness, or absence of the vesicular murmur. These states were remarkably evinced in the case of Margaret Drummond, very similar to that of Broadley, and in those of Elizabeth Meek and Robert Reid, to be afterwards noticed. The two latter, however, come under the head of influenza, as they were immediately excited by that epidemic.

Influenza appeared in this city with considerable severity, and affected great numbers of persons ; and I had occasion to see not only many cases in private, but a considerable number, either admitted into the Institution, or already within its walls. The disease, indeed, attacked within the course of one week the whole of the female patients in No. 13, in different degrees of severity, according to the complaints under which they were labouring. Though in most of these persons, and also in private, the disease assumed the character of inflammation of the mucous membrane of the facial cavities, throat, and windpipe, in others, it appeared in the shape of general pains of the head, back, and limbs, without much prominent catarrhal affection.

In the former class of cases, the treatment consisted in an emetic, or an energetic purgative at the commencement, small doses of the solution of acetate of ammonia, (*Spiritus Mindereri,*) immersion of the lower extremities in warm water, and the inhalation of the vapour of warm water. In the latter, the diaphoretic effect of the acetate of ammonia was augmented by the addition of antimonials, or the use of Dover's powder. Under this mode of management all the ordinary cases became completely well.

This disorder, nevertheless, presented several instances in which, either in consequence of previous disease, or of constitutional peculiarity, or neglect in the use of remedial means, the disease assumed a much more formidable character. One case of this kind proved fatal from the concurrence of the causes now specified ; and several others assumed appearances so serious as to require the active use of appropriate antiphlogistic measures.

The fatal case occurred in private ; and its symptoms were so characteristic as to merit short notice.

Mr H. had cough the whole winter ; but, from having always enjoyed excellent health, paid to it no attention. In the last week of April, he was attacked with the usual symptoms of influenza, in a form so slight that he continued to attend his business daily. In this course he persevered for five days, when on Thursday, 2d May, he felt sensations of cold and shivering so distinct, as to compel him, on going home, after the employment of some common domestic remedies, to retire early to bed. Next day, though he was much the same, he did not consider himself as requiring medical assistance; and, indeed, he had always manifested a singular aversion to the use of professional advice of any kind for himself personally. It was only, therefore, on Sunday the 5th, when he began to show symptoms of incoherence and loss of memory, that the family sent for my friend, Mr Caird, their ordinary medical attendant. At this time he had not only frequent harassing cough, with difficult expectoration of scanty mucus, but the skin was dry; the pulse about 76 to 100; the countenance livescent; the temporal arteries distended; and slight lethargy, alternated with loss of recollection and confusion of thought. Mr Caird ordered him a cough mixture, consisting of squill, spirit of nitrous ether, wine of colchicum and English paregoric; and also directed some medicine to open the bowels, and some antimony to act on the skin and the secretory circulation.

Next day, he was much the same, rather relieved if any thing. But on Tuesday, the symptoms of affection of the brain were more conspicuous, in the circumstance of great restlessness, confused frightful dreams, spectral delirium, and *subsultus tendinum.* Next day, (8th May,) when I saw him, the pulse was 102, rather tense; some weight and fulness of the head; much heat of the skin, which had also a yellowish tint; lethargic stupor, alternating with watchfulness and delirium; much *subsultus*, and occasional slight spasmodic twitches of the muscles of the face and the eyelids. The chest sounded pretty well; but there was distinct mucous rattle in the *bronchi* and vesicles of both lungs, most in the right, with a sense of weight at the cardiac region and lower extremity of the chest. The bowels were slow, and the urine was scanty. Leeches were applied to the head; a bolus, containing six grains of calomel and nine of the compound powder of scammony, was given; and the solution of acetate of ammonia, with some spirit of nitrous ether, was ordered. In the evening, when the calomel had operated, the head seemed rather less oppressed, and the spectral delirium was less urgent. The *subsultus*, however, was worse; the lethargic state was much the same; and the countenance was still too livescent. As he had suffered much from sleeplessness, an antimonial opiate was ordered, containing fifty drops of the solution of muriate of morphia; and six grains of calomel were at the same time administered, to be followed by some infusion of senna in the morning.

He slept quietly for several hours,—from ten till four next morning. Some time after this the respiration became quicker than before, with great increase of the mucous rattling in the windpipe and bronchial tubes, and of the lethargic appearance of the face. When Mr Caird and I were sent for at seven, he was unable to expectorate, but was breathing rapidly, with much mucous rattle in the windpipe; the face was livescent, the head hot, and the temporal arteries much distended. The bowels had not been opened, nor had urine been voided since morning. From this state, however, he was capable of being roused, so as to take a little spirits and water and some tea. A turpentine enema was administered, turpentine embrocations, and frictions, were applied to the head and chest, but with little or no effect. By raising him to the semi-erect position, he was enabled to breathe more freely and easily, the livescence of the countenance abated, and he could answer questions, and attend to the directions given. These symptoms of amelioration, however, were merely temporary; and, after continuing to breathe very hurriedly and feebly for four hours, he expired at half-past two.

It was impossible to obtain permission to inspect the body. But, from what I have witnessed in similar cases, I had no doubt that the affection of the head, which performed so conspicuous a part in this case, was merely secondary, and the result of the previous disorder of the lungs. The bronchial membrane of Mr H. had been in an unhealthy state the whole winter; and it only required the accessary influence of the influenza, with the persevering neglect of remedies for several days, to induce an attack of complete bastard peripneumony (*catarrhus senilis*). The first effect of this was to impair the extent of respiration, by contracting the smaller bronchial tubes and the pulmonary vesicles; and the second effect was to retard the circulation of the blood through the pulmonic capillaries, or the communicating vessels of the pulmonary artery and veins. As this retardation was gradually but steadily converted into obstruction, it operated on the circulation of the brain and, perhaps, other organs. But as the former, by preventing the return of venous blood from that organ and its membranes, gave rise to the loss of memory, incoherence, restlessness, and lethargy (*coma vigil*), livescent countenance, and the *subsultus tendinum*; and as the latter locked all the secretions,—as the biliary, urinary, &c., the only mode of restoring these divisions of the circulation to the healthy state was to follow the course in which they had been deranged; and to re-establish, first the pulmonary circulation, when, it might be presumed, that of the cerebral would follow. This, however, it was impossible to do in such a constitution, and at such an age as that of Mr H.; and, though depletion was indicated in one sense, it was contraindicated in another. In short, all peripneumonic disorders which have begun to operate on the cerebral circulation are to be regarded as extremely difficult to control or remove.

I shall only mention other two cases of this nature, in which a more favourable result was obtained.

Elizabeth Meek, 27 years of age, of decent and otherwise healthy appearance, was admitted on the 15th May with respiration at 40 in the minute, laboured, with elevation of the shoulders, and *orthopnœa* so complete, that when she falls asleep for a few minutes, she starts under the sense of impending suffocation. Occasionally she could breathe when lying prone on the face; but the only easy posture was the sitting one. The chest sounded preternaturally clear, and mucous and crepitating rattles were heard on both sides, but most intensely on the left. The action of the heart was very intense but heavy, through the whole chest, and in the epigastric region. The pulse was 128, full, and hard; the tongue dry and furred; the bowels bound; the urine scanty and high-coloured; and the countenance pale and anxious.

The woman stated that she had been subject to asthma, for which she had been often bled; but that she was comparatively well until two weeks ago, when, after an attack of influenza, the present symptoms ensued. Blood-letting from the arm, to the extent of twelve or fifteen ounces, according to its effect and her strength, was directed to be followed by an antimonial opiate, and three compound colocynth pills, followed by six drachms of castor oil. The blood-letting being found at twelve ounces to produce weakness of the pulse, paleness of the face and lips, and approach to fainting, was carried no further.

The use of these measures was followed by sleep, considerable abatement of the *orthopnœa* and laborious respiration, which was attended with less elevation of the shoulders, but still with much central contraction of the lower circumference of the chest, and mucous and crepitating rattle all over the left side. The right presented less of this sign. The action of the heart, however, continued preternaturally violent, but without bellows or rasping sound, and the pulse was still 120.

Blood was now drawn from the left side of the chest near the spine by the application of twelve leeches, an opiate was ordered at bed-time after the depletion, and next morning six drachms of castor oil. The effect of this was to relieve much the painful weight of the chest, and the difficult breathing in the course of the night. The pulse fell to 102, and became softer; and the respiration to 32. The stethoscopic signs were the same, with the addition of the sibilous wheeze in the left side. She could lie on the back and side, but still preferred the prone position. The expectoration, consisting of viscid mucus, was abundant.

The action of the heart, which was still too strong with diffuse pulsative area, indicated the difficulty with which the blood circulated through the pulmonary artery and capillaries into the pulmonary veins, while the great central contraction of the lower circumference of the chest during inspiration denoted the great efforts made by the *diaphragm* to inspire as much air as possible.

With the view of relieving this internal congestion, another local bleeding from the upper extremity of the chest by twelve leeches was directed, and a blister between the *scapulæ* was ordered, with the anodyne antimonial. Next day, 18*th*, the respiration had fallen to 30, with less elevation of shoulders and contraction of chest, and the sibilous rattle was passed into the sonorous. The symptoms now continued much the same till the 20th, when, with respiration at 28, and pulse 108, the mucous rattle continued occasionally with sibilous and sonorous, and tumultuous action of the heart; and the expectorated mucus was dense and viscid. An emetic of ipecacuan and tartrate of antimony was followed by great relief, and reduced the pulse to 96, and the respiration to 24; and after this, pills, consisting of one grain of sulphate of zinc, a quarter of a grain of opium, and two grains of extract of henbane, given three times daily, rendered her capable of quitting the hospital.

This woman, however, instead of going to Lasswade, as she represented to me she was to do, went to reside somewhere in town in the house of her brother, where she was exposed to cold and wet, and returned to the hospital on the 11th June, nearly in the same state in which she was when first admitted. A blood-letting of eight ounces from the arm, followed by the antimonial opiate, and a dose of castor oil, rendered the breathing more easy and less hurried, and reduced the pulse from 94 to 88; and ten ounces of blood drawn from between the shoulders by cupping was followed by relief of all the symptoms, and reduction of the pulse to 76. In this state, when the appetite was good, and she had no complaint except occasional cough with expectoration, and partial night sweats, she was ordered again pills consisting of two grains of sulphate of zinc and three grains of henbane; and she went out quite well on the 2d of July.

In this case, there is reason to believe that there is incipient dilatation of the right ventricle, and that, unless the patient takes the greatest care to avoid the causes of bronchial and pulmonary disease, chronic *bronchitis* will be permanently established, with its usual consequences, *emphysema* of the lungs and diseased heart.

About twelve months ago, when I had occasion to be a few days at Fountainhall, near Pencaitland, in East Lothian, I was requested to see a collier, named Robert Reid, who was said to be very ill of asthma, and who was led to hope, from the amelioration effected in the case of Mrs Low, a woman whom I had treated for chronic *dyspnœa* with some benefit, that some relief might be afforded to his complaints. They were, however, much more intense, and of longer duration. He had suffered more or less from cough and *dyspnœa*, often amounting to *orthopnœa*, for twenty years; and it was not to be expected that complaints so inveterate could be easily controlled. I did not then note the particular stethoscopic signs further than that the chest sounded preternaturally clear, respiration was performed with much sonorous *rhonchus*, and the action of the heart was heavy and jarring, and the pulsative area too much diffused. As he was living at a distance, it was impossible to adopt active means. But, under the use of occasional emetics, squill mixture, and antimonials, with flannel, his complaints were somewhat alleviated.

He spent the winter rather better, but was attacked very violently by influenza in the spring; and for four or five weeks he continued in a very deplorable state with *orthopnœa*, constant cough, febrile heat, quick pulse, and great loss of strength, partly with want of sleep, partly by loss of appetite.

On Saturday, the 22d June, when I had occasion again to be at Fountainhall, I was requested to see this man, and found him with a pulse at 108, respiration at 30, and impracticable, unless in the sitting posture, very strong sonorous *rhonchus*, mixed with sibilism and crepitating rattle, very extensive pulsative area, and especially pulsation in the epigastric region.

The countenance was pale and anxious, the bowels slow, and the urine not above one pound daily. It was easy to see that little could be done unless under the eye of the physician; and as I found he had been thinking of repairing to Edinburgh for advice, I advised him to come to the hospital for a few days. He accordingly was conveyed to town on the ensuing Thursday, (June 27th.)

Whether from the gestation, or the change of air, or removal from a small smoky confined cabin, with a damp earthen floor, to a large, dry, well-ventilated apartment, it is not easy to say, but Reid felt himself greatly better the day after admission. He had slept better than he had done for months; the respiration was less laborious, with abatement of *orthopnœa*, and the pulse had fallen to 90. Still, however, there was much effort of the extraordinary muscles of inspiration; the lower circumference of the chest was forcibly contracted; there was much sonorous *rhonchus*, with occasional sibilous wheeze in both sides; the pulsation of the heart was violent, jarring, and its area preternaturally diffused; and in the *epigastrium*, where strong pulsation was still felt, there was constant weight and tensive pain. The expectoration was viscid mucus streaked with dark matter, derived apparently from the carbonaceous air of the colliery. A mixture of squills, meadow-saffron wine, and English paregoric, was ordered for the cough; blood was drawn from the space between the shoulders by cupping; the bowels were emptied by the compound colocynth pill, the black-draught and castor oil; and a blister was afterwards applied to the *sternum* and region of the heart. In the course of a few days after the use of these means, the cough abated much, the *orthopnœa* subsided entirely, the labour of the respiration disappeared, with considerable diminution of the sonorous *rhonchus*, and the pulse came down to 80. The urine, however, continued scanty and high-coloured, and the weight and tensive pain at the epigastric region was not alleviated.

This imperfect state of the urinary secretion might depend either on some disease of the kidneys, or on a more general affection of the sanguiferous system. On examination, however, it was found to be natural in density (1025,) and to be void of coagulable matter; so that the scantiness of the secretion seemed attributable to the state of the pulmonary and general circulation. With the view, however, of neglecting nothing, he was ordered, on the 1st July, the compound saline diuretic powder four times daily; and under the use of this, with leeches applied to the epigastric region, the urine increased, in the course of nine days, from one pound to two pounds and a-half daily.

From the 10th, he proceeded well to the 14th July. At this period, however, all his symptoms underwent a remarkable aggravation from the influence of a moral cause. A man in the next bed to Reid was admitted on Saturday the 13th July, with symptoms of gastro-enteric disorder, to be afterwards noticed, and which underwent so much amelioration, that at the visit on Sunday he felt himself comparatively well. That night at ten he was attacked with intestinal hemorrhage so profuse and violent, that by three the next morning he was a lifeless corpse. The sudden termination of the life of this man struck Reid so forcibly, that he had no sleep that night; the difficult respiration recurred with nearly its original intensity, and next day I found him with a pulse at 96, panting laboriously, a pale ghastly look, the sonorous *rhonchus* and sibilous wheeze as intense as ever, and much violent and tumultuous action of the heart, with great increase of the tensive pain of the epigastric region. Eight ounces of blood were directed to be drawn from the epigastric region by cupping; and though not more than six were obtained, partly from this spot, partly from the back, his suffering was very much relieved. The tensive pain went off, the respiration gradually returned to its former state, the sonorous *rhonchus* and sibilous wheezing were diminished, and the action of the heart became more moderate.

Next day, with the view of relieving the internal vascular congestion still more effectually, twelve leeches were applied to the lumbar region, with the effect of producing very decided relief; and after remaining eight days more in the house for the use of the tepid bath, this man returned home, not cured, indeed, but in a state of relief more decided than he had been for years, and in the enjoyment of greater comfort than he had ever expected to possess.

I saw Reid about three weeks after, and found him continuing comparatively well; and I have since that repeatedly heard of him, and know that he enjoys better health than he has done for several years.

Of the cases of Pleurisy, three belonged to the chronic form of the disease.

The first occurred in the person of Grace Dingwall, aged 19, a girl who was brought on the 20th November from Portobello, with symptoms of continued fever, with great affection of the head and chest. The immediate urgency of these symptoms was relieved by general and local blood-letting, shaving the head, cathartics, saline mixture, and the *aqua acetatis ammoniæ*, with antimonials. About the tenth day, (30th November,) when the cerebral symptoms were much abated, the pectoral symptoms underwent a marked exacerbation in the form of pain of the right side of the chest, not referred to a definite part, but aggravated by inspiration, frequent cough, soreness of the throat, and pain under the *sternum*, and a hard wiry feel of the pulse, which was rapid, from 120 to 132.

The chest sounded dull on the right side; but respiration continued distinct all over the upper, posterior, and inferior part of the chest, and even at the central, towards the *sternum*. On the middle of the right side alone, respiration was less distinct than elsewhere. But there was neither ægophony nor total absence of the vesicular murmur.

Leeches were repeatedly applied on this side, and had the effect of relieving some of the sense of weight with occasional pain. She was distressed, however, with frequent sickness and occasional hiccup; and hectic accessions were observed daily. These continued to recur, and the strength was progressively so much enfeebled, as to preclude accurate stethoscopic examination latterly. She died on the 20th December.

Upon inspecting the body, the *pleura* investing the upper lobe of the right lung was found adhering by recent lymph to the costal *pleura*, and the lower surface of the lung adhered, in like manner, to the diaphragm. Between these spots, *i. e.* below the lower margin of the upper lobe, and above the superior margin of the lower lobe, about a pint of sero-purulent fluid, with shreds of lymph, was contained between the costal and pulmonic *pleuræ*, while the middle lobe of the right lung, and the upper part of the lower lobe, were forced towards the *mediastinum*, and there compressed by the effused fluid.

The brother of this girl afterwards informed me, that, about two months previous, she had been knocked down, and kicked on the right side and belly, and that, ever since that time, she had complained of obscure pain and weight of the right side.

I may observe, that *empyema* on the right side is rather rare; and that, in about twelve cases of the disease which I have seen, the fluid was effused into the *pleura* of the left side.

This was the case in the following example.

Mrs Stevenson, a married woman of 22, was admitted on the 8th of May with cough, rapid and difficult breathing, amounting to *orthopnœa*, and quick pulse, stated to be of three weeks' duration. Upon examining the chest by percussion and with the stethoscope, the right side sounded naturally, but presented bronchial *rhonchus*, and much subcrepitous rattling; the left side sounded dull, but presented the vesicular murmur very indistinct, and the bronchial respiration faint, but with much mucous rattling. The motion of that side continued.

Blood was drawn from the arm to the amount of eighteen ounces, with great relief, and from the chest and *epigastrium*, where she complained much, by means of leeches. Blisters were applied, and calomel and opium, with a mixture of the spirit of nitrous ether, was directed to be given. Under the use of these means, she was evidently much relieved; and though the respiration continued too rapid and short, this was attributed chiefly to the pressure of the gravid *uterus*,—pregnancy being advanced, by her own account, to the seventh month.

The debility, however, was so great, that it was always with great difficulty I could persuade her to allow me to examine the chest and the respiration, and hence it was not done thoroughly till the existence of a large collection of fluid in the left side was manifest.

On the 23d May, I showed the pupils, that not only did the chest sound dull all over the left side, but the ribs were completely motionless, and no respiratory murmur was heard. These symptoms indicated the presence of an extensive collection of fluid, which, from the history of the case, and the collateral symptoms, we were entitled to presume was purulent. I then hinted at the necessity of puncturing the chest and evacuating the fluid; but I found that to this the friends were averse, as the patient was evidently dying; and I was, I acknowledge, not desirous to allow the operation to suffer, by performing it in a case which held out, from various circumstances, not a decided chance of recovery. She died on the 25th of May.

Upon inspection, more than four pounds of purulent fluid were found in the cavity of the left *pleura;* and when this was removed, the *pleura costalis* was found covered with a layer of albuminous exudation, rough and irregular, with many loose shreds. The left lung was also forced towards the spine and *mediastinum*, and compressed into a flat triangular mass, not larger than the closed hand. When removed from the chest, it sank like a piece of lead in water, and it could not be inflated, or made to rise, by blowing air into the bronchial tubes. Its *pleura* was covered by two coats of lymph,—one superficial, soft, thick, and recent, with irregular shreds, the other immediately adherent to the membrane,—thin, firm, and like a piece of hard writing-paper, and capable of removal only with difficulty. The heart was slightly thrust to the right side.

These appearances showed that this woman must have laboured under two separate pleuritic attacks,—one at a remote date, and which had terminated by covering the pulmonic *pleura* by a coating of albumen, which had eventually become hard and condensed,—another, more recent, which had terminated in the effusion of, 1*st*, lymphy exudation; and, 2*dly*, a copious secretion of purulent fluid, which had disjoined the lymph connecting the two *pleuræ*, and forcibly compressed the lung towards the *mediastinum* and spine. I regretted extremely that I had not attempted the operation; because, though it was doubtful whether the left lung would have finally risen, the right was comparatively free from disease, the pneumo-bronchial affection with which she entered having subsided.

In the following case I was more fortunate in the effects of the operation, in prolonging the life of the patient, though equally unsuccessful in eventually curing the disease.

Antonio Tourquoni, aged 38, an Italian, from the neighbourhood of the Lake of Como in Tuscany, but resident for two years in this country as a figure-maker, was admitted on the 7th May 1833, with symptoms of fever, and a sense of weight in the epigastric and hypochondriac regions, with a sallow dingy tint of the countenance, and a yellow colour of the *conjunctiva*, which were then conceived to indicate the presence of an affection of the liver. He had about this time a little cough; but stethoscopic examination did not indicate the existence of any marked disease of the lungs. The pulse was 120; the skin was dry; the bowels confined; and the urine was of a deep yellow tint, and threw down a deep green precipitate on the addition of muriatic acid.

Blood was drawn repeatedly from the epigastric region by means of leeches; the bowels were freely opened by calomel and the compound colocynth pill, or castor oil, or infusion of senna; and on the 13th the symptoms were so much alleviated, that he was allowed common diet. On the 18th, he complained of pain in the course of the *latissimus dorsi*, for which the local application of the hartshorn liniment, with the purgative effect of half an ounce of oil of turpentine, and an equal quantity of castor oil, was prescribed. The effect of these remedies was to remove the uneasy sensations; and he had no complaint till the 24th, when the occurrence of pain and tenderness in both hypochondriac regions, and in the epigastric region, rendered necessary the application of eighteen leeches and a dose of calomel, with the compound colocynth pill. The effect of these was to relieve the pain slightly; but as swelling, fulness, and tension over the epigastric and hypochondriac regions continued, the leeches and purgative medicine were repeated.

On the 27th, when he was complaining of pain and tenderness all over the left side of the chest, it was found that that side was tender upon pressure, dull on percussion, and void of respiratory murmur; that the ribs were almost motionless, and that there was a perceptible degree of fulness in the intercostal spaces. On examining the right side of the chest, it was found that the respiration was 40 in the minute, with sibilous and subcrepitous rattle in the bronchial tubes, and that the chest sounded naturally. It was now evident that fluid was contained in the cavity of the left *pleura*; but twelve leeches were, in the meantime, ordered to be applied to the left side of the chest, in order to abate the tenderness and pain. On the following day it was found that the left side was œdematous; that the ribs were entirely motionless during inspiration and expiration; and that the circumference of the left side of the chest, measured about an inch above the nipple, was an inch broader than that of the right side; but at the level of the lower extremity of the *sternum* it was only about three lines broader. He had now occasionally profuse sweating; and although the pain was relieved, the dulness on percussion remained the same. The intercostal spaces were enlarged; and though he was much emaciated, they were more prominent than the ribs. The impulse of the heart, which had been hitherto heard on the left side, was now tending to the right, and faint ægophony was heard the next day near the dorsal margin of the *scapula*.

It is unnecessary to detail the progress of the symptoms between this time and the date of the operation, which I now proposed to the patient as the only chance of his recovery. It is sufficient to say, that, after a great deal of persuasion on my part, with resistance on his, I prevailed on him to allow it to take place on the 7th of June.

I therefore made an incision between the sixth and seventh ribs of the left side, about an inch anterior to the *serratus magnus*, through the intercostal muscles, and into the cavity of the *pleura*, and then introduced a flat trocar and cannula, and drew off about one pound of purulent fluid, the trocar having been frequently obstructed by large flakes of lymph. I then secured the cannula in the wound, and plugged up its orifice.

On the following day, when I found he had spent a good night, without increase of fever, cough, or difficult breathing, the pulse being about 100, as I had experienced the inconvenience of using the flat cannula recommended by authors, in not being sufficiently large to allow the issue of the albuminous flakes, I enlarged the wound backwards by the probe-pointed bistoury, and then introduced a large cylindrical cannula, which rapidly drew off two pounds and a half of thick purulent matter, with large albuminous flakes, and afterwards, with the alternate suction and expulsion of air through the cannula during the motions of expiration and inspiration, a few ounces more. He was now allowed a little fowl and two glasses of sherry daily.

Two days after, it was found that the tube had been forced out; but, upon replacing it, six ounces of purulent fluid, partly thin and partly consistent, were discharged. The chest now was resonant, but the œdema continued over the left side of the mammary region.

After this a quantity of purulent fluid, varying from six to eight or even ten ounces, continued to be drawn off every second or third day through the cannula, or by means of a large silver catheter introduced through the wound. On the 19th, when it amounted to eight ounces, and was rather fetid, the opening into the cavity of the *pleura* was so large and so completely fistulous that I thought that the cannula, which was rather painful, might be withdrawn; and a tent made of charpie was accordingly from time to time introduced into the wound, and maintained in its position by adhesive plasters. On the 24th, when the pulse was so low as 84, the discharge amounted to nine ounces, and was thick and still fetid; and he was at the same time much distressed with sweating during the night.

At this time, also, my invention was sorely taxed to give him food which might nourish without stimulating, and support his strength without aggravating the morbid action in the *pleura*. Of the ordinary articles of diet and drink he was quite tired, and he began to be affected with occasional diarrhœa. To oppose this, rhubarb and carbonate of iron, the thebaic pill, and latterly, the chalk mixture with laudanum, were administered. But no sooner was the diarrhœa arrested, than he was attacked with headach, giddiness, impaired vision, hot dry skin, red dry tongue, and loss of appetite. To remove these symptoms he was ordered, on 13th July, powders consisting of carbonate of soda, valerian, sulphate of quinine, and aromatic powder; and, under the use of these medicines, he at length not only got rid of the symptoms already-mentioned, but the discharge diminished in quantity, and he began to recover flesh and strength.

At this time, however, an accident rather unpropitious occurred. On the 16th July, both Mr Duncan and myself were sorely astonished to find that the portion of charpie inserted the previous day had disappeared, and that the wound was quite open; and as it was certain that no one had withdrawn it, though I was willing to flatter myself that it had been forcibly expelled by a fit of coughing, yet, as it was no where to be found, I was rather apprehensive that it had been drawn into the chest. No untoward consequence, however, ensued; and both of us were for several days satisfied that the tent must have been expelled by coughing. On the 22d of July, however, when eight ounces of purulent matter were discharged, in attempting to clear the wound of what I conceived to be flakes of lymph,—a very frequent occurrence in the course of this case,—I seized by the forceps and drew through the wound, first one large piece of soft macerated charpie, and then another. It is very remarkable that the presence of this foreign body in the cavity of the *pleura* not only produced no inconvenience, but after its removal, Tourquoni appeared to advance more rapidly and decidedly than before.

Between the 20th and 29th July particularly, he made great progress; and after the 5th of August, when four ounces of purulent matter were discharged, the secretion was so much lessened, that not more than two ounces required to be withdrawn in the course of a week. After this period, when his strength increased sensibly, he was able to be out of bed for several hours daily, and was in the habit of walking through the ward, and even going down stairs. The left side of the chest was very much contracted, and was smaller than the right; the heart was now felt to pulsate upon the left side; the rustling of the respiratory murmur was also distinctly heard below the left *mamma*; and the wound, which was now only filled with a small bit of charpie, was already much depressed between the two ribs, indicating the progress of the contracting process.

About the end of this month, the certainty of his recovery had made him confident; and I have reason to believe that he committed several errors of diet. At all events, in consequence of a foolish challenge given him to prove the return of his strength, he run a race the whole length of the ward, down stairs, and partly up again. But for this he suffered very severely. The same evening he was attacked with an intense fit of shivering, followed by heat and headach, preventing sleep; and the following day, when I entered the ward, I found him with a flushed, brown, bloated countenance, injected eyes, painful throbbing of the temples, hot dry skin, much thirst, and a sharp small vibrating pulse at 124. Blood was ordered to be drawn from the temples by leeches, the bowels to be cleared out by the colocynth pill, and he was put upon the saline mixture and low diet. The day after, though the headach was much relieved, and the pulse had fallen to about 100, his countenance was anxious, and his general appearance unfavourable. The third day after, viz. the 5th, he complained of pain under the *sternum*, extending from the throat to nearly the lower part of it; and, as the pulse continued rather hard and sharp, he was ordered to lose twelve or fifteen ounces of blood, and to have leeches applied on the left side of the *sternum*, where the pain was chiefly felt. Stethoscopic examination indicated only a grating action of the heart.

By the means now mentioned, the pain felt beneath the *sternum* was alleviated; but it was evident that the vital powers of Tourquoni were now so much enfeebled, that, while it was imprudent to push depletory remedies farther, it was impossible to expect that he could recover without their use. He continued to linger for five days more in a spiritless and desponding condition, and expired upon the 11th.

Inspection, September 13, 1833.—The ribs were sawn through low down on the left side. A firm line of adhesion was on this side found extending longitudinally from the first to the seventh rib, parallel to, and about two inches from, the left margin of the *sternum*. On the left side of this was a cavity of a triangular shape, situate between the costal and pulmonic *pleura*, of such capacity as might hold about six ounces of fluid, and which contained about two and a-half ounces of purulent matter. When the matter was removed, the membrane appeared red, and rendered rough and irregular by the disruption of coagulable lymph, partly organized; it was also much thickened and indurated, as if cartilaginous. The cavity was bounded before by the line of adhesion already mentioned, and behind by a longitudinal line, extending from the inferior extremity of the chest downwards, at the distance of about two and a-half or three inches from the vertebral column. Its outer wall was formed by a very thick firm false membrane covering the costal *pleura*, at least one-fourth of an inch thick, and as firm as cartilage. The *pleura* was not itself thickened; but much solid matter was deposited on the attached as well as the free surface. The *periosteum* of the ribs was very generally detached from them and thickened, and the ribs were rough, and of a milk-blue colour. The margins of the second, third, and fourth ribs were denuded, rough, and irregular; and the upper margin of the eighth rib (on which the cannula had rested) presented a depressed notch one inch long, rough, denuded, and absorbed.

The lung of the left side had risen very considerably in every direction, and there was reason to believe that it could have risen still further; and it appeared that the narrow cavity above-mentioned was in the process of being filled by the progressive deposition of lymph, the resilience of the lung, and the contraction of the chest.

On laying open the *pericardium*, the cause of death was evident. That membrane contained about six ounces of serous fluid; and on its internal surface, both capsular and cardiac, was a thick deposition of coagulated albumen, which was still recent, and presented the usual wrinkled and reticulated appearance of that deposit in *pericarditis.*

The spleen was enlarged to four times its usual size, and weighed at least eight ounces. Its peritoneal tunic was opaque, smooth, and of grayish-white colour, in consequence of the previous occurrence of inflammatory action at a remote period.

In this case, it is impossible to doubt that the operation of *paracentesis* of the chest virtually cured the chronic pleurisy or *empyema.* The lung had risen considerably, and would have risen much more completely had the life of the patient not been cut short by another disease. The empyematous cavity also had become very much diminished, and there was every reason to believe that it would have been eventually obliterated by the joint effect of the resilience of the lung and the contraction of the walls of the chest. The heart also had returned to the left side, and even the patient had partially recovered flesh and strength. The occurrence of *pericarditis* demonstrates, I conceive, a peculiar tendency in this man to inflammation of the serous membranes. It was my own belief that a disposition to this action was originally acquired by his residence on the Lake of Como, where it is certain that the *malaria* very often begets this tendency. In illustration of this belief, it is not to be forgotten that the spleen of this man was very much enlarged, and that its investing membrane was indurated and thickened exactly like the spleens of those persons described by Grottanelli as occurring in the agues of the Pitiglian territory and other level districts in Italy. *

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* Ad Acutæ et Chronicæ Splenitidis in Humilibus præsertim Italiæ Locis consideratæ, &c. Auct. Stanislao Grottanelli, Ph. Med. Ch. Doct. Florentiæ, 1821.

The escape of the tent into the chest was singular but not unprecedented. An analogous but rather more serious accident, I was informed by the late Dr James Gregory, occurred in the case of a patient attended by the Second Dr Monro. The cannula was lost within the chest for ten days, and at length presented at the wound, and was extracted.

I may mention, that I have since performed the same operation for partial *empyema* in a child of 5, a private case. But as the case is still under treatment, I shall defer its history till a subsequent opportunity.

I should now proceed to the cases of *phthisis*; but it would be impracticable, within the limits of a report like the present, to introduce all the points deserving remark in a disease so important as that of pulmonary consumption.

I shall merely advert to four.

1. The cases of pulmonary tubercles occurring in Edinburgh are chiefly of two kinds. One consists of masses amorphous or irregularly shaped, variable in size, from that of tares or small peas up to filberts, and consisting in general of a dirty ash-gray or whitish tyromatous matter, which eventually undergoes softening, disruption, and expulsion.

This form of tubercle, viz. the tyromatous, is certainly the most common, and it is the one which I observed in the greater number of phthisical cases. In the course of its proceeding to softening it gives rise to a chronic congestion of the pulmonic tissue, or a chronic peripneumony, and, at the same time, or at least soon after, to chronic bronchial inflammation. I have observed in several cases, but particularly in a woman named Gillies, that the only signs of this bronchial inflammation are a strong deep rasping *rhonchus* heard generally in the centre and upper part of the lung, intermingled with occasional or frequent sibilism. I have in several cases observed, that, when this had continued for some time, mucous gurgling, not previously perceptible, was detected about an inch or an inch and a-half beneath the clavicle, and was eventually succeeded by indistinct pectoriloquy. The sonorous *rhonchus* then gradually abated, while the sibilism continued, and was accompanied by mucous and subcrepitous rattling, heard chiefly in the centre of the lung.

The appearances after death in these cases, particularly in those of Stewart, Grant, Pearson, and several others, showed clearly that the softening and excavation of the tubercular masses had rendered the substance of the lung generally brown, red, consolidated, and inelastic, with more or less infiltrated serum, and had thrown the bronchial membrane connected with these parts into a state of chronic inflammation.

2. The other sort of tubercle consists of minute hard bodies, extremely firm, and of a dark-blue or inky colour, like grains of gunpowder, of a size seldom exceeding that of a large pin head, and disseminated extensively, and almost equally, through every part of the lungs. These correspond probably to the miliary tubercles of Bayle; but I am not prepared to adopt the view of Laennec, that they are merely the early or nascent form of the tyromatous tubercle. They are certainly less frequent than the tyromatous tubercle; and in the cases occurring in the Royal Infirmary this season, they occurred in not more than five in twelve cases. I am not satisfied that they tend to softening, but, by their presence in the pulmonic filamentous tissue, they keep up a species of irritation which eventually leads to chronic peripneumony. In this manner, a man named Thomas Peterkin, aged 42, admitted on 27th April with symptoms of influenza, and terminating in peripneumony, died on the 30th, although he had been previously in the enjoyment of good health.

In some instances, the dark-coloured small granular tubercle occurs in combination with the large amorphous tyromatous tubercle.

3. A very common occurrence in phthisical subjects is enlargement, inflammation, and ulceration of the intestinal glands. Though this did not occur in all the cases, it was observed in five or six of them,—particularly in Margaret Stewart and Margaret Grant. In Margaret Grant especially, and in Janet Weir, the ulceration of these glands had destroyed the mucous and submucous tissue, and affected so much the peritoneal membrane as to cause inflammation, with exudation of albuminous patches on the free surface.

4. I attempted the inhalation of chlorine and iodine gas, in a diluted form, in the cases of Mrs Wilson, William Henderson, and Thomas Carmichael; but its effect was merely temporary, and it certainly did not prolong the life of the patient, or alleviate his sufferings.

Diseases of the heart form rather a large proportion. But scarcely one form of disease of the heart was more predominant than another. Of the ten cases mentioned in the list, two consisted in general hypertrophy, with dilatation of both ventricles; three presented concentric hypertrophy of the left ventricle; in two there was contraction of the left auriculo-ventricular opening, with extensive osseous deposit and disorganisation of the valves; and there was reason to believe, that in other two, Lutfoot and Smith Johnstone, in which permission to inspect was refused, either the aortic opening, or the left auriculo-ventricular opening, was contracted, and the left ventricle was contracted and hypertrophied.

The most important circumstance, however, in speaking of this subject, is the fact, that hypertrophic thickening of the left ventricle, with contraction of its cavity, or the disease denominated by Bertin concentric hypertrophy, is extremely common, and may proceed to a very great extent without giving rise to any particular signs, physical or stethoscopic, which could unequivocally demonstrate its presence. This form of disease of the heart presented itself in a very marked degree in the case of Isabella Allan and John Hawkins, and less strongly in several others.

In the case of Isabella Allan particularly, who was labouring under distinct symptoms of disease of the kidney, with the hard tense *œdema* or swelling of the legs and albuminous urine, which almost invariably attend renal disease, the most careful examination of the chest by the stethoscope gave no indication except a slow labouring action of the heart. Upon examination after death, it was found that the heart was of it ordinary size, or rather small; that the walls of the left ventricle were in some parts about an inch thick; that their substance was extremely firm and dense; and that their chamber was so much contracted as not to contain more than two tea-spoonfuls of fluid. This case was so remarkable, that I had a drawing taken of the section of its walls and cavity.

The case of John Hawkins, in which this change had taken place to a less extent, was also remarkable, in not furnishing stethoscopic or other indications of disease of the heart. But, from the circumstance of his being attacked at intervals with a peculiar sensation ascending from the region of the heart upwards to the left *mamma* and left arm, and sometimes to the right arm, and lying during those fits motionless and incapable of speaking, though, with all his senses, I was led to infer the existence at first of an affection of the dorsal part of the spinal chord; and afterwards of a *neuralgia* of the heart similar to *angina pectoris.* I did not, indeed, suppose that the presence of this *neuralgia* necessarily implied organic disease of the heart; but, as the symptoms occurred only in fits, and as he was perfectly well in the intervals, and no irregular or inordinate motion could be detected in the action of the heart, I was led to regard it as more immediately an affection of its nervous system or dynamic properties. These fits disappeared under the use of a seton introduced after I ceased to have the charge of him; but in the course of eight days after quitting the house, he was again admitted for an attack of *erysipelas*, which in a few days proved fatal.

The case of Jess Waits, a married woman of 30, was singular. On the 24th of January, as I was entering the hospital, I found a woman with the face reddish, flushed, and livescent, sitting on the staircase, and breathing with extreme labour and difficulty. On asking her why she did not proceed to the waiting-room, she answered that she was completely exhausted by walking from the Tron Church to the Infirmary, and that she was utterly unable to ascend a single step of the stair by reason of the difficulty of her breathing. Though she was much emaciated, had frequent harassing cough, a pulse at 120, much mucous rattle in the bronchial tubes, and copious expectoration of thickened mucus, and the duration and course of these symptoms denoted an affection of the lungs and bronchial tubes, it was evident that the degree of *orthopnœa*, and the livescent tint of the countenance, indicated a much more serious disorder of the organs of circulation than is usual in cases either of chronic bronchial inflammation or tubercular softening. I gave directions in the meantime, that she should be immediately carried up stairs and placed in bed for attentive examination.

It was then found, that, though *dyspnœa* was constant, it became occasionally aggravated to an insufferable degree, with great anxiety, and that she was rarely so easy as to allow her to lie down in the horizontal position. Exertion of any kind was followed by violent palpitation; yet, when quiescent, the sounds of the heart were natural. Night-sweats were pretty regular and copious; and she expectorated a good deal of viscid mucus, mixed with frothy fluid, the former sinking in water.

The chest sounded well on percussion. Under both clavicles the sound was rather clear; but the surface was so tender, and the anxiety so great, that complete and satisfactory examination of the chest was impracticable.

These complaints, she stated, had come on only four months previous, in consequence of exposure to cold. She had lost blood, and was blistered at their first approach, with some relief; but on their recurrence about two weeks ago, blood-letting afforded no alleviation.

As this case had the general appearance of a complication of chronic *bronchitis* with disease of the heart, the nature of which, however, could not be positively ascertained, it was thought expedient first to relieve the urgent symptoms of disordered respiration, in order afterwards to discover, on their removal, what was the exact nature of the lesion of the organs of circulation. She was therefore treated with an antimonial mixture, blisters between the *scapulæ*, opiates and purgatives, as seemed indicated by the symptoms. Under these remedies, the constancy of the cough and *orthopnœa* was abated. Afterwards on the 28th, when the fits of coughing became more urgent, it was considered expedient to order her lozenges consisting of two grains of extract of henbane, half a grain of ipecacuan, and six grains of liquorice, which had the effect of relieving the *dyspnœa* and cough very considerably. On the 30th, while she was still rather improving, and had recovered some appetite, an egg was added to the allowance of food; but on the 4th February the cough had been so troublesome, that it was found necessary to give an emetic, and apply a blister, which were followed by evident alleviation of her sufferings. Next day she felt herself so much better, that she was allowed four ounces of steak three times weekly. On the evening of the 6th, after receiving a visit from her husband, and without any remarkable change in the symptoms, she suddenly sunk down in bed in an apparent swoon, but was found to be quite dead.

The peculiar *dyspnœa* and *orthopnœa* during life, as well as the sudden mode in which death took place, indicated here a disease of the heart or its appendages; and the result was confirmed by inspection.

The *pleura* of the right lung adhered firmly to the costal *pleura* at the sides, and to the diaphragm below. The lobes were united by false membrane, indicating the previous existence of interlobular pleurisy.

The superior lobe of the right lung was firmer, more condensed, and less elastic than natural. Its substance was of a reddish-brown colour, much loaded with bloody serum, and its vessels much distended with dark-coloured blood. The bronchial tubes of this lobe were also filled with frothy sero-mucous fluid, and the whole filamentous tissue of the lung was of a deep reddish-brown colour.

The middle lobe was generally indurated and consolidated, of a bluish slaty-gray colour, incompressible and inelastic, but void of tubercles. The bronchial tubes of this portion were enlarged, and contained much thick, opaque, puriform mucus, which flowed freely from them on division and on pressure.

The inferior lobe of the right lung was very much indurated, and of the same colour as the middle, equally inelastic, and also void of tubercles. It presented, however, large cavities, irregular in size and shape, though generally cylindrical, mutually communicating, and containing thick opaque purulent matter, slightly tinged with blood. These cavities communicated freely with the bronchial tubes, which were very much enlarged. Much matter issued from them in the attempt to detach the lung from the ribs and diaphragm.

The left lung was perfectly healthy. The right auricle of the heart was dilated by a large fibrinous clot attached to the *musculi pectinati*; and the ventricle was filled with a similar one attached to the walls and tendinous chords. The left auricle and ventricle were natural.

About half an inch beyond the aortic semilunar valves, the *aorta* was dilated into a globular sac as large as a good-sized pippin, (at least two inches and a-half in diameter,) situate chiefly at the posterior part of the tube, and surrounded by the arch above, bounded on the right and before by the superior *cava*, above by the bifurcation of the *trachea*, on the left side and behind by the pulmonary veins, and before by the pulmonary artery, by which it was crossed. The aperture into this sac was more than an inch in diameter, nearly circular; and its inner surface was studded by patches of steatomatous matter. The tumour also encroached on the mesial margin of the right lung.

In this case it is evident that the presence of the aneurismal tumour operated in two ways in producing the extreme difficulty of breathing, the *orthopnœa*, and the livescence of the countenance. By its situation it necessarily compressed both bronchial tubes, but especially the left one, and consequently impeded the exit and entrance of atmospheric air. But it also compressed so much the pulmonary veins as to impede the transit of the blood from the lung into the left auricle of the heart.

In two of the cases of jaundice, Margaret Speedie and Mary M'Lennan, the serum of the blood drawn exhibited, on the addition of muriatic acid, a very copious precipitate of bile.

In the treatment of these cases, I regarded the jaundice as a mere symptom; and, as I was confident from the collateral circumstances, and especially the painful distension of the hypochondriac and epigastric region, that it depended upon a subacute inflammatory state of the liver, I directed blood to be drawn, not only from the arm, but from the side by cupping, and from the epigastric region by leeches, repeatedly, according to the symptoms and the effect of these evacuations; and compound colocynth pill, and calomel, or the blue pill, alternated with doses of castor oil, to be exhibited daily, or every second day; and, under these remedies, the yellowness of the eyes and countenance gradually abated, until it totally disappeared.

In the case of the man Ross, in whom general blood-letting was not indicated, I found leeches over the epigastric and hypochondriac region, with the purgatives already specified, and the warm-bath, adequate to remove the disease. This method of treating cases of jaundice, which I have pursued for several years, I have found much more efficient and successful than any other.

4

Of the cases of dysentery, one deserves notice from the obstinacy of its symptoms, and the peculiarity of the cause by which it was maintained. It occurred in the person of Margaret Meldrum, aged 23, servant in the family of a respectable professional gentleman. This girl concealed her complaints for at least three weeks; and it was only the urgency of the *tormina*, and bloody slimy stools, with frequent vomiting, which at length betrayed the character of her complaints. At admission on the 28th January, with a good deal of fever, the symptoms were opposed by calomel and opium, general blood-letting, local bleeding by means of leeches, anodyne and emollient *enemata*, castor oil and sedative liquor, and then acetate of lead and opium,—with the effect of abating the *tormina* and *tenesmus*, diminishing the frequency of the stools, and removing the vomiting entirely. The pulse, however, continued quick; she complained of pain in the umbilical region; and the stools were still slimy and bloody; and even puriform matter was discharged. Blood-letting was again employed, therefore, on the 4th of February, with the effect of removing entirely the pain; while vomiting, which had again recurred, was checked by the effervescing draught; and the acetate of lead and opium, with occasional emollient *enemata*, were continued.

At this time, however, the aspect of the discharges led me to doubt whether the colon had been ever completely emptied, notwithstanding the laxatives employed; and on the 6th, I directed an enema, containing an ounce of the sulphate of magnesia, and the same quantity of castor oil, to be injected into the intestines. This brought away copious scybalous masses; and, with the view of emptying the bowels more thoroughly, minute doses of sulphate of magnesia, or phosphate of soda, were given by the mouth. It was still requisite, however, to detract blood from the left iliac and the hypogastric region by means of leeches, and to confine the patient to diet consisting of arrowroot, boiled rice, whey, milk, either alone or diluted, or mixed with lime-water, and to take care that the bowels were regularly and periodically evacuated, either by Epsom or tasteless salts, or the colocynth pill, or *enemata* of sulphate of magnesia and castor oil. Under this method of treatment, the puriform discharge became less copious and frequent, and was occasionally absent; the slimy bloody stools disappeared entirely; the pain of the belly abated; *tormina* were less frequent; *tenesmus* disappeared or was rarely felt; appetite returned; and the patient recovered so much flesh and strength as to be able to walk about the ward.

There was still, however, on the 6th March, so great tendency to constipation and accumulation, that it was found requisite to administer the colocynth pill to the amount of six, eight, or ten in the course of one day, in order to maintain the peristaltic action of the intestines, and to propel their contents steadily downwards. A recurrence of the appearance of purulent discharge obliged me to have recourse to acetate of lead and opium in the form of *enemata*,—the former to the extent of ten grains, the latter to that of forty minims, or a drachm of the sedative liquor. I then thought it was a proper time for the use of charcoal, which was given with rhubarb and aromatic powder from the 26th March to the 7th April, without much benefit. On the 8th, she was ordered isinglass in solution; and under this, with the occasional application of leeches and tartar-emetic ointment to the left iliac and umbilical regions, she recovered so much as to be able to quit the house on the 7th of May.

This case, I conceive, from its symptoms, was a complication of *Colonitis* or dysentery, with obstinate constipation; and the chief cause of the difficulty of removing the dysenteric symptoms was the tendency to accumulation. After this was subdued, the disease had left a morbid state of the intestinal mucous membrane, which only yielded to a very restrained and regulated diet, with the employment of the isinglass solution.

The case of gastro-enteric hemorrhage, (*entero-rhagia; melæna*) occurred in the person of George Craig, a man of 35, sanguine and plethoric in appearance. This man, who had been at one time a soldier, but now pursued the occupation of a tailor, had been for many years past addicted to incurable and uninterrupted habits of dram-drinking; and all the money which he was enabled to procure was spent in indulging this craving for liquor. For two weeks previous to his application at the hospital, he had complained of a painful sense of weight and distension all over the *abdomen*, but referred more particularly to the umbilical region, and the upper margin of the hypogastric. This was accompanied with sensations of dulness, headach, impaired appetite, occasional squeamishness, much thirst, and general feebleness. The headach subsided on the 2d or 3d day; and the only symptom which continued obstinately was the faint squeamishness and the painful sense of tension and weight, which was at admission referred to the epigastric, umbilical, and upper part of the hypogastric regions, with the occasional sickness, but without vomiting, tenderness, or tension. The tongue was white and moist; the bowels were reported regular; the pulse was natural, from 70 to 80; and the skin of moderate warmth.

Two colocynth pills and three ounces of infusion of senna had the effect of moving the bowels freely but gently, cleansing the tongue, and abating the abdominal pain very much; and on the 14th he had no complaint except squeamishness. As the pulse and cutaneous heat were natural, all medicine was omitted; and he was left to the effect of the fever diet and time.

He continued easy and without complaint, except a little sickness, till about eight in the evening, when he began to feel a sense of weight in the belly, which continued till half-past ten. At this time an urgent call to stool was followed by a copious gush of pure blood from the *rectum*, which was repeated at different times in the course of one hour and a-half, till it amounted to five or six pounds. At 12, an opiate enema was administered; and after this no more blood was discharged; but he continued in a very faint and languid state for about three hours, and expired at 3 on the morning of the 15th.

The blood discharged from the intestines when examined next day consisted of dark-coloured fluid blood mixed with large clotted masses.

On laying open the cavity of the *abdomen*, the peritoneal surface of the intestines was deeply stained of a dark-pink red colour, in some points lighter, in others more intense, but particularly so along the whole course of the *ileum*.

In the cavity of the stomach there were found two pounds of blood, chiefly dark-coloured, partly clotted and grumous, partly semifluid. When this was removed the mucous membrane was observed to be deeply tinged with red blood, and the membrane was itself thickened and injected, but not softened. The mucous membrane of the *œsophagus* was perfectly pale and blanched. On holding up the mucous membrane to the light, the large vessels were seen much loaded, and the substance of the membrane itself deeply tinged, and the small vessels distributed through it. Upon the most careful examination of the membrane, no blood was found issuing from any particular aperture.

The mucous coat of the *duodenum* was in like manner coloured deep-red, and the glands were somewhat more distinct than natural. The whole mucous membrane of the *jejunum* and *ileum* was in like manner deeply tinged with red blood. Fully three pounds of blood, partly fluid, were found chiefly towards the lower part of the *ileum;* and when this was removed, and the mucous membrane carefully washed, it still presented a very deep coloration, its vessels much injected, and the *villi* much erected and covered with a thin pasty layer, which was also tinged red. On the most careful examination of the whole membrane, no aperture could be discovered, but merely a general oozing from the membrane. Previous to removing this substance, the superior mesenteric artery was exposed, and a quantity of water forcibly injected, but without detecting any open or ruptured aperture, the water escaping only from the surface of the membrane by numerous minute vessels. The intestinal glands, both solitary and agminated, were perfectly healthy. A small quantity of clotted blood was found in different parts of the colon, but its mucous membrane was healthy.

The liver was perfectly healthy.

The spleen was very much softened, and of a deep colour, like masses of coagulated blood.

Head.—The membranes and surface of the brain were more injected than natural, and its substance presented numerous dark red streaks. The ventricles were also dilated, and contained a small quantity of serum. A good deal of serous fluid was found in the subarachnoid tissue at the base of the brain.

The lungs were perfectly sound.

The heart was free from disease, and its valves perfectly healthy. But the beginning of the *aorta*, between the semilunar valves and the arch, was much elevated and irregular, from steatomatous matter deposited in tubercular masses, and especially around the origin of the large vessels; and a large crimson-red patch was found on the arch under the *tunica intima.*

The right kidney was deeply injected, but healthy; the left presenting some disease of the granular matter.

These appearances show clearly that the intestinal hemorrhage which had proved the cause of the death of this man did not proceed from any single vessel, or two or three vessels, which had been eroded, perforated, or ruptured, as might have been imagined, but that it issued from the vessels of the entire mucous surface of the *duodenum*, *ileum*, and perhaps also from those of the stomach, previously thrown into an injected and congested condition, and then undergoing disorganization at their extremities, as in *melæna*, yellow-fever, and similar states of the gastro-enteric mucous membrane. I afterwards learned from a respectable man, who was in the habit of employing Craig, that he was a habitual dram-drinker,—that all the money which he earned was spent in the purchase of spirits,—and that, after he had received a few shillings for his work, he was in the habit of spending it all by sixpences in drinking, so that he was often days without food, or taking anything but the deleterious liquor to which he was so much attached; and that, previous to the illness which proved fatal, he had spent several days in this pernicious course.

Of *Cirrhosis* of the liver, three cases occurred.

The first took place in the girl Mary Pearson, aged 20, who was admitted with well-marked symptoms of tubercular destruction of both lungs. Besides quick pulse, wasting, distressing cough, expectoration of dense puriform mucus, tightness of the chest, and weight beneath the *sternum*, this girl presented the signs of mucous gurgling about an inch below the right clavicle, and the same phenomena near the *axilla* on the left side. The bronchitic symptoms were alleviated by a small general blood-letting, local bleeding by leeches, blisters between the *scapulæ*, inhalation of warm vapour, antimonial and squill mixtures, and opiates. But she presented, in addition to her pectoral disorder, general tumefaction of the belly, with much pain and weight across the hypochondriac and epigastric regions, where a hard uniform resisting mass was felt, occasional vomiting, and frequent distressing diarrhœa, with griping pains of the intestines. To alleviate the latter symptoms, which were attributed to inflammation and ulceration of the intestinal mucous membrane, besides the occasional use of opiates, starch enemata were administered, and Dover's powder, and occasional small doses of castor oil, with solution of muriate of morphia, were employed. Her strength was latterly supported by nutritious diet, with a little wine.

These measures were merely palliative. Death took place on the 7th March, after much suffering from an increase of the abdominal pain, and the oppressive weight and distension of the hypochondriac and epigastric regions.

In consequence of particular circumstances, the body was inspected, not in the hospital, but elsewhere. Large excavations were found in the upper lobes of both lungs; and the rest of these organs was much indurated and occupied by tubercular masses. The tract of the intestinal tube, though inspected with care, presented no distinct ulceration, and only traces of vascular injection.

The liver, however, was very much enlarged, both transversely and longitudinally, so as to occupy in the former direction the epigastric region, and encroach on the left hypochondriac, and to descend as low as the navel in the latter direction. The surface was uniform and regular. But its substance was doughy, and of an orange yellow colour; and when divided the *acini* were seen distinctly of the orange colour, and somewhat soft and doughy, but larger than usual. The weight of the organ was not ascertained in this case; but it must have been between eight and nine, if not ten pounds.

The next case occurred in the person of the girl Johanna Mackintosh, aged about 20.

This girl, who was deaf and dumb, was admitted on the 30th May, with considerable uniform enlargement of the belly, accompanied with pain of the *abdomen*, and heat and tenderness of the surface, so as to preclude very accurate examination. Below the navel the *abdomen* emitted the natural sound on percussion, and was elastic and compressible; but above this line it sounded dull, and was firm, inelastic, and incompressible.

The countenance was pale, wan, and slightly infiltrated; the urine was scanty; the bowels reported regular; the pulse 96 to 100, feeble; the skin hot and dry, or only partially moist. The legs were also firmly inflexed upon the thighs, so as to be incapable of extension without extreme pain; and for this complaint, which seemed to cause most uneasiness, chiefly she applied for admission. It was stated by her friends, that the limbs were affected by pains, and that the *catamenia* stopped about thirteen months ago; and that afterwards the legs became gradually inflected on the thighs. The abdominal swelling was observed only within the last three days. The deafness ensued about two years after birth.

The only remedies used were some aperient medicines.

The first object in this case was to reduce the general abdominal swelling, in order to ascertain how much of it depended on tympanitic distension, fecal accumulation, watery effusion, and organic change; and as there was reason to believe that there was slight peritoneal inflammation, and that the presence of feces and air added much to the pain by distension, the bowels were first emptied by means of the colocynth pill, and leeches were applied to the belly, while her feeble and languid condition was believed to require the use of a valerian and camphor mixture, with some ether.

Under the use of these remedies, the pain of the *abdomen* abated sensibly; but the hardness and swelling continued. Next day (the 2d June) after the use of the warm bath, not only was the pain very much relieved, but the general swelling and tympanitic distension of the belly were so much abated, that the nature of the case became manifest. It was then seen, that, in the situation of the right hypochondriac and epigastric regions, there was a firm resisting mass, with a thick edge, and a distinct fissure or notch in the centre, near the *umbilicus*. This circumstance showed at once that the upper dull part of the abdominal tumour was the enlarged liver, which had extended into the epigastric region, and descended so low as to place the inferior margin on a level with the *umbilicus*. Pressure on this hard body gave no uneasiness; and the principal suffering endured by the patient arose from the painful distension which so large a mass caused to the muscular and intestinal *peritoneum*.

Having thus determined that the liver was the chief cause of the abdominal tumour, it was next to be ascertained what was the nature of the disease of the liver. There was no obvious derangement of the biliary secretion, unless that it was scanty; consequently there was no reason to believe that the glandular part of the organ was disordered, or if it was, it must have been a slow and gradual change. Though the pulse was frequent, there was no distinct hectic; and, therefore, the idea of any process of suppuration or softening was also precluded. The chief dynamic disorder appeared to be interruption to the circulation of the portal vein. In short, there were principally three changes, to one or other of which it was requisite to ascribe the hepatic enlargement. The one was the *tuber circumscriptum* of Dr Farre; the second was the general enlargement consequent on adipescence of the liver; and the third was that attending *cirrhosis*. There was no great reason to believe that it arose from adipescence of the liver; and one or other of the other two were the lesions which I conceived might be present in this case.

In the meantime, the treatment was continued so as to act on the mesenteric and portal circulation; to promote the secretion of the skin and kidneys; and to obviate internal congestion. The respiration was occasionally confined, in consequence of the pressure of the hepatic tumour on the diaphragm. She was therefore put on the decoction of dandelion and nitre; a remedy which is much used on the continent, and which I have occasionally found very useful in promoting the flow of urine. She was also ordered the warm bath. The leeches were repeated according to the urgency of the tenderness, heat, and pain of the *abdomen*; and, with the view of acting on the kidneys, she was ordered to take the saline diuretic powder three times daily. Under these remedies, and nutritious diet, she proceeded very well till the 18th, when a fit of cold shivering, followed by restlessness and preternatural heat, indicated an attack of *erysipelas*, then prevalent in the ward. The usual remedies were actively employed. But the pulse and respiration became very quick,—the latter laborious; and death took place on the afternoon of the 23d.

On inspecting the body next day the following changes were found.

The liver was very much enlarged, occupying not only the right hypochondriac, but the whole of the epigastric region, extending into the left hypochondriac region, and descending about four inches below its usual level. The right margin was very thick and rounded, being at least three and a-half to four inches. Its colour externally was mottled orange yellow; and when divided it presented definite shaped particles of an orange or deep fawn-colour, interspersed with the natural liver or nutmeg brown of the organ, only much paler. The substance of the whole organ was particularly blanched; and its vessels were empty of blood. It was also doughy and inelastic, and communicated to the finger a sensation as if consisting of a mass of firm dough. Incisions emitted a serous fluid, with minute particles of oleaginous matter. It was, however, uniform on the surface, and in the substance, and presented neither fatty nor whitish tyromatous masses. Its whole weight amounted to nine pounds.

The *pancreas* was unusually firm and indurated; and its substance when divided was of a dead cream colour.

The spleen was very much enlarged in all its dimensions, being about seven inches long, one and a-half thick, and weighing exactly twelve ounces. With the exception of a slight degree of firmness, its substance was otherwise natural.

The granular part of the kidneys was unusually pale and bloodless, and of a faint orange colour.

About five ounces of serous fluid were found in the cavity of the *peritoneum;* but this membrane was otherwise natural.

A considerable quantity of serous fluid was effused in the subarachnoid tissue; and about four drachms of serum were found in the lateral ventricles, which were very much dilated, but otherwise healthy. The brain and nerves were sound.

A quantity of consistent purulent matter was found in the tympanal cavity and mastoid cells of the right ear; and the *incus* was denuded of its investing membrane. The *stapes* of the right side was found attached at both ends, but denuded. Matter was also found in the tympanal cavity and mastoid cells of the left side. The *malleus* and *incus* of the left side were denuded; and the tympanal membrane was eroded and perforated. The *stapes* of this ear could nowhere be found.

The object of the inspection of the brain and internal ear was to discover, if possible, the cause of the patient being *surd-mute.* It was ascertained from the mother, that, when an infant, she heard well; and it was only about the age of eighteen or twenty months that she began to appear insensible to sounds; and when she did not attempt to articulate at the age at which other children exhibit that faculty, the mother began to apprehend that the child was deaf and dumb for life. This suspicion was realized. The girl never could be brought to understand or to utter articulate sounds, notwithstanding a long period of tuition at one of the institutions; and the inspection shows that the incapacity of speaking arose from previous deafness; and that this deafness was occasioned by inflammation and suppuration of the membrane lining the tympanal cavity, which not only, by the presence of matter, prevented the sonorous vibrations from being transmitted to the labyrinth and nerves, but also destroyed the muscles, and rendered the tympanal bones incapable of their natural motions.

As the labyrinth and the nerves distributed to the *cochlea* and semicircular canals were sound, it might become a fair question how far puncture of the *membrana tympani* might have been useful in restoring hearing. I should fear that it could not, as the matter was so viscid and adherent that it could not have flowed out spontaneously; and the mastoid cells were quite distended with it. At all events, I know one case in which this operation was performed by the late Dr Gordon on the tympanal membrane of an old gentleman, the father of an intimate friend; but without any improvement in the hearing of the patient; and, on inspection after death, the mastoid cells were found quite crammed with viscid purulent matter; and the tympanal membrane itself was covered with a small quantity of the same substance in a more fluid state.

The third, and, perhaps, the best, case of cirrhotic degeneration, was presented by the liver of Henry Cookson, aged 35, a man who was admitted on the 13th day of intense continued fever. The peculiar symptoms, and the treatment pursued in this case, it is unnecessary to detail. Though the febrile process was mitigated, it was not prevented from terminating fatally; and inspection showed that no remedies whatever could have been of the slightest avail.

The vessels of the *pia mater* were very much loaded and congested; the subarachnoid tissue perfectly opaque, and distended with the quantity of serous fluid effused; the ventricles dilated, and filled with about four drachms of blood-coloured serum; the vessels beneath the *epithelion* much loaded, and more numerous than usual; the gray matter of the brain and *cerebellum* absolutely of a faint-rose colour with injection, and blood issuing from numerous large points and streaks of the white cerebral substance. The gray matter of the annular protuberance was highly rose-coloured.

Both lungs were very much gorged and distended with blood, chiefly dark-coloured; and the bronchial membrane, on both sides, was deeply embrowned, somewhat villous and roughened; and the tubes and pulmonic vesicles contained much reddish brown frothy sero-mucous fluid.

At the posterior region of the middle lobe of the right lung was a portion firm, solid, uncrepitating, and inelastic, and which, when divided, was granular and incompressible, of a reddish-gray colour, and discharged most abundantly a foul ash-coloured puriform fluid, which partly issued from minute bronchial tubes, partly from the interstices of the granular matter. This portion, which was equivalent to about two cubic inches, was separated by a distinct boundary from the adjoining lung, which, though not granular or solidified, was doughy, inelastic, and of a deep-brown colour. The superior lobe only was sound.

The left lung was, if possible, still more diseased. The external convex surface presented in the *pleura* an indented contracted hardened patch, like the trace of a former cicatrix; but when divided and inspected, it was found to be simply a thickened, indurated, and contracted portion of *pleura*, uniting the two lobes together, probably the result of previous pleurisy. Behind this, in the upper region of the inferior lobe, was a firm inelastic uncrepitating portion of lung, which, when divided, was equally granular with that in the right lobe, and discharged the same ash-coloured foul sero-purulent fluid from the small tubes and interstices. This indurated granular portion, which was at least two cubic inches, was irregular in shape, but was distinguished by a line from the surrounding lung, which was very dark-coloured, doughy, and infiltrated with bloody serum. The portion below was of the colour of venous blood, firmer at the margins, but rather soft in the centre, and more uniform than the pulmonic tissue generally appears. In short, this and one or two adjoining spots were approaching the state rather preposterously denominated pulmonary apoplexy.

The heart was sound; but one of the *laciniæ* of the mitral valve was firm, thickened, and irregular, something like cartilage, and the mutual margins of the aortic semilunar valves were hard and cartilaginous.

The surface of the liver was of a mottled orange or tawny tint; and when the *peritoneum* was removed, this colour was found to reside in numerous bodies, varying in size from the head of a millet-seed to that of a sago-grain, or a good-sized tare, irregular in shape, though generally spherical, and soft, elastic, and fatty-looking. These bodies, which were manifestly the *acini* much enlarged, were separated from each other, or rather united by thin lines, which appeared to be the ordinary filamentous tissue of the organ. Their colour varied; but in general it was of the orange, or tawny hue, verging to yellow. In some it partook more of the red, but this was probably from transuded or effused blood.

The liver was not much enlarged or altered in shape, unless in being rather thicker than usual, especially towards its lower margin, which was thick, rounded, and obtuse. In general consistence it was a little firmer than natural, and when divided, emitted serous fluid with oleaginous particles. It weighed five pounds one ounce. Part of the peritoneal covering of the right lobe was thickened, opaque, irregular, and as firm as bone.

At the pyloric end of the stomach, near the great arch, the mucous membrane was marbled and areolated, of a slate-gray colour, and the mucous membrane generally was congested and vascular. The mucous membrane of the *duodenum* was irregular, tuberculated, and highly vascular.

In the intestinal tube the solitary glands were very distinctly developed.

The kidneys were much congested and loaded with blood; but the structure otherwise healthy.

It is manifest that the chief cause of the violence of the disease and its fatal termination in this case was the previously existing lesion of the lungs. It is a fact which I have had occasion pretty frequently to observe, that, though fever is a morbid process never free from danger, it derives most of the virulence which its symptoms assume, and all the danger almost, from the previous existence of lesions of the lungs, the heart, the liver, or the intestinal tube. The cause of this I shall explain more fully hereafter. But it may be requisite here to observe, in reference to the present case, that, as the febrile process consists very much in a general loaded state of the capillary vessels of the whole frame, and as the chance of recovery depends principally, if not entirely, on the powers which these vessels possess of contracting on their contents, and returning to their usual diameter, under the use of auxiliary means calculated to favour this result;—in every case in which the capillaries of any organ are already rendered unfit to perform this necessary function, the chance of recovery is diminished by the whole influence which that organ possesses in the economy. In the present case, the already diseased state of the lungs, by their incapacity to circulate the pulmonary blood, not only added to the general congestive state all over the body, but aggravated much that of the brain, and prevented the capillaries of the other organs from returning to their healthy state. With healthier lungs this man might have recovered. But with such a state of the pulmonary circulation, and a liver which must have interrupted much the circulation of the portal vein, and consequently that of the intestinal tube, recovery was physiologically impossible.

Hydatids.—The existence of the genuine hydatid is not so frequent as is represented by many pathologists, who have too often, in the case of the ovary especially, confounded with this body common cysts containing limpid serum. Of the genuine hydatid, of the family *Cestoidei*, one example only occurred this season; but it was highly characteristic and unequivocal. It occurred in the person of Isabella Allan, the patient whom I have already mentioned as exhibiting a perfect specimen of concentric hypertrophy of the left ventricle of the heart, and whom I shall have occasion to mention as an instance of disease of the glandular tissue of the kidney. At the inferior surface of the liver, imbedded in the substance of the left lobe, was a large, rather irregular, elastic tumour, inclosed in an exterior cyst. When this was divided, it was found to contain a quantity of limpid serous fluid; and adherent to its internal surface was a cluster of about seventy or eighty membranous cysts, of a flattened spheroidal shape, with semitransparent coats, and containing limpid serous fluid. These presented the other characters of the *echinococcus* of Zeder and Rudolphi.

The convex surface of the liver adhered to the diaphragm firmly and extensively by a considerable quantity of albuminous exudation, effused in columns and shreds, of some standing.

The peritoneal cavity contained about four pounds of serous fluid. The intestines were much distended by air; and the peritoneal covering adhered in various parts to each other by means of lymph, partly recent, partly of old formation; and these adhesions were most frequent among the pelvic *viscera*, and on the ascending arch of the colon, the peritoneal covering of which also adhered to the abdominal *peritoneum*, and to several of the convolutions of the small intestines by lymph of recent formation. On dividing the upper part of the *rectum*, a considerable quantity of purulent fluid escaped, and was found to proceed from a cyst formed by adhesions between the anterior part of the *rectum* and the superior and posterior part of the *uterus* and *ligamenta lata*.

The course of the gastro-colic *omentum* was occupied by a pretty firm albuminous exudation, which gave it considerable thickness.

Cases of Disease of the Kidney, with or without dropsical effusion, are very frequent in the Royal Infirmary of Edinburgh. But it is unnecessary, in this Report, to enter into any particular details, after the full accounts given by Dr Bright, Dr Christison, and Dr James C. Gregory. I may only say upon the present occasion, that, independent of the changes mentioned by Dr Bright, two instances occurred in which it was evident that the albuminous urine and the dropsical infiltration depended on a chronic inflammatory action of the glandular or granular part of the kidney. The kidneys in these cases, and especially in one of them, viz. Janet Weir, were irregular on the external surface, with minute eminences and depressions; and each of the latter could be recognized to be much more vascular than the eminences. It was evident, therefore, that these hollows were the seat of a local congestion, the effect of which was to remove by absorption a part of the granular tissue of the kidney. The substance of this tissue was farther extremely vascular and congested.

Both the patients in whom this form of renal disease occurred had been persons of very irregular and debauched lives; and one had not only been repeatedly under the influence of mercury, but in the month of March she was in the house for a painful swelling and ulceration of the gums, partly the effects of repeated doses of mercury, partly that of the extensive deposition of tartar at the roots of the teeth, and which was evidently rapidly producing suppuration of the alveolar membrane, and would have certainly expelled several of the teeth, if not checked by appropriate treatment. The tartar was removed, and the gums, and even the *periosteum* of the *alveoli* were freely divided by deep incisions; and in the course of a few days she went out perfectly well.

She returned in the month of August with symptoms indicating pulmonary consumption, disease of the intestinal glands, and uncontrollable diarrhœa, and died in the course of about eleven or twelve days.

The other case occurred also in a public woman, in whom the whole of the nasal bones had been destroyed, and expelled by the suppurative action of their *periosteum*, induced by repeated mercurial courses.

The case of corroding ulcer of the womb was interesting, chiefly on this account, that it exhibited an example of a curious species of retention of urine *(ischuria ureterica ;)* arising from adhesive inflammation blocking up both *ureters.*

The patient, Margaret Dalzell, aged 50, a married woman, was admitted on the 6th July, in an advanced degree of extenuation, and with complaints of inability to retain the feces, and loss of power of the lower extremities. The tongue was glazed and dry, the skin hot and dry, yet the pulse varied only from 64 to 80. I perceived, however, that she had a lethargic stupid appearance; and, on the 7th, to this were conjoined frequent startings of the tendons, with a peculiar contracted Hippocratic expression of the features, and a urinous exhalation from the whole person. The patient herself could give no distinct account whether she passed urine or not, but, by examining the nurse, I ascertained that not one ounce was voided in the course of the twenty-four hours. She was allowed some wine, with powders of sulphate of quinine, valerian, and carbonate of soda; and the catheter was directed to be introduced, in order to ascertain whether there was urine in the bladder. Not above an ounce and a-half of urine was discharged, and there was no hypogastric tumour; and she continued for three days in the same semi-lethargic state, continuing to exhale a urinous odour, and died on the morning of the 11th July.

Upon inspecting the body, the *os uteri* was found to be destroyed by irregular corroding ulceration, with some induration of the surrounding substance of the *uterus*. There was, nevertheless, no tubercular appearance; and no new formation of fibrous or fibro-cartilaginous structure. Upon laying open the *pelvis*, there was observed on the right side a pyriform bag, which was found to be in the site of the right *ureter*, and which evidently contained a fluid. On the left side was found a similar pyriform elastic bag, though not quite so large; and when the parts were removed by careful dissection, it was recognized that a deposit of albuminous inflammation enclosed each *ureter*, that the ureteric coats were thickened, indurated, and inflamed, and that their canals were so much contracted as to impede the descent of the urine into the bladder.

The corroding ulceration having destroyed the orifice of the womb, especially at its posterior and lateral walls, had produced inflammation extending upwards into the *pelvis* on both sides. There it had spread to each *ureter* about an inch and a-half above their junction with the bladder; and having first produced inflammation and thickening of their coats, so as to contract their cavity, had finally enclosed them in a general mass of albuminous deposition, which had undergone almost complete consolidation and contraction.

The case of tubercular disease of the *peritoneum* affords a striking example of the slow and insidious manner in which diseases of this description may advance, and of the small proportion of characteristic symptoms to which they may give rise.

Mrs Leburn, aged 65, was admitted on the 8th of August, with difficult breathing, amounting to *orthopnœa*, weight at the epigastric region, pulse varying from 86 to 90, and very scanty urine. As the right side of the chest was found to sound dull, and as no respiration was heard, or motion of the ribs observed, it was inferred that the right *pleura* contained a large quantity of fluid; and, as the motions of the heart gave, upon repeated examination, no sign of deranged action, it was further concluded, that the presence of this fluid was independent of disease of the heart. It was accordingly proposed to puncture the right side of the chest, and evacuate the fluid; and to this, after much opposition and delay, when she found she was getting no better under the other remedies, she at last consented.

On Saturday, the 17th of August, I accordingly made an incision over the upper margin of the eighth rib into the *pleura*, and then introduced a large trocar, which in the course of about five minutes withdrew about fifteen pounds of a dark wine-coloured fluid. No unfavourable accident ensued; the breathing and *orthopnœa* were much alleviated; and for some time hopes were entertained that recovery might be effected. In the course of about eight or ten days, however, fluctuation of the *abdomen* was recognized; and in a fortnight more it was deemed necessary to puncture the cavity of the *peritoneum.* This was accordingly done on the 3d of September; and about nineteen pounds of straw-coloured fluid were withdrawn. Relief was in this manner again obtained.

This poor woman, however, was complaining of a peculiar sense of painful weight and tenderness in the epigastric and umbilical regions; and though nothing could be felt on careful examination, except a degree of general resistance and hardness in the umbilical region, I had reason to believe, from the dropsical symptoms, and the extreme and almost unrivalled degree of emaciation, that there was some morbid process certainly going on in the organs essential to nutrition. The emaciation, indeed, in every part of the body was extreme; but in the head, face, and trunk, the appearance was that of a skeleton covered with mere skin. The stomach began to be affected with squeamishness and occasional retching and vomiting, which sometimes subsided under the use of opiates and wine; and the kidneys were so inactive that the average quantity of urine secreted in the twenty-four hours seldom amounted to six ounces, and never exceeded eight. In this state she lingered two weeks longer, and died on the 2d of October. Inspection of the body was with some difficulty obtained.

Between three and four pounds of dark wine-coloured fluid were found in the right *pleura*, and about five pounds in the left. A few old adhesions connected the two divisions of the right *pleura* at the upper lobe of the lungs, and at the inferior margin of the inferior lobe. The heart was sound.

The whole of the free surface of the *peritoneum* presented a numerous crop of minute globular bodies of a dark-blue colour, extremely hard, and varying from the size of a minute vetch to that of a garden pea. From these bodies no part of the *peritoneum* was exempt; but they were most abundant upon its intestinal division at the upper part of the *ileum*, and through the mesentery corresponding to that part. When divided by the knife, they presented a dark blue structure, glistening, homogeneous, and exceedingly solid and hard, without the appearance of fluid either secreted, or the result of softening. The transverse arch of the colon and the stomach were pushed slightly farther down than natural; and between these two bowels was placed a longitudinal mass, about three-fourths of an inch thick and eleven inches long, and extending in breadth from about two inches and a-half to three inches, lying obliquely across the umbilical region, so that the left extremity was about an inch more elevated than the right.

The left extremity of this body was connected with a small dark-coloured tetrahedral-looking substance, which evidently represented the spleen, or rather the superior extremity of that organ. The right extremity was adherent to the right angle of the colon, and partly to the corresponding part of the liver and *peritoneum.*

Upon cutting into this substance, it presented a firm, reddish, yellow-coloured structure, traversed by a few small vessels, and occasionally intermixed with a more solid whitish matter. It seemed to be divided into lobules, and presented an appearance intermediate between adipose and pancreatic *sarcoma.* The *omentum* was wanting. From the latter circumstance, and the anatomical situation and physical characters of the tumour, I infer that it was a degeneration of that part of the *peritoneum* which forms the gastro-colic *omentum,* which indeed it represented.

The *pancreas* was found behind in its usual position, and perfectly healthy, but compressed by the tumour now mentioned.

Anaemia Hæmorrhagica.—This case, which occurred in the person of Margaret Taylor, aged 30, admitted April 11, was the result of uterine hemorrhage; and, from the extreme pain of the head, as well as of the hypogastric region, might have been readily mistaken for some febrile or inflammatory condition of the system. Under the use, however, of cold applied to the shaven scalp, cathartic *enemata,* opiates, valerian, and small doses of wine, and a very gradual allowance of nutritious diet, complete recovery was effected; and she went out quite well upon the 20th.

The case in which *periostitis* was combined with *ozæna* was in various respects interesting. It occurred in the person of a woman named Robina Wright, aged 29, who had been long known as one who, though not exactly a public female, had been subjected to repeated courses of mercury. At a former period, syphilis had produced destruction of the *recto-vaginal septum*; and she subsequently suffered much from the contraction consequent on cicatrization. At present (19th February) she applied for admission for symptoms of rheumatism; but the pains mistaken for this disease were evidently the *dolores osteocopi,* or the deep-seated aching pain resulting from inflammation of the *periosteum* of the *tibia* and of both *parietal* bones.

The usual remedies of local depletion and counter-irritation were applied. Opiates were exhibited, and the warm bath was administered; and, had it not been for the epidemic prevalence of *erysipelas* at this time, with the dilapidated state of the patient's constitution, this woman's sufferings might have been alleviated, and the disease retarded in progress.

An obstinate fetid puriform discharge, however, from the nostrils, with some tenderness in the situation of the nose, indicated the existence of inflammation of the *periosteum* of the bones of the face; and the occurrence of *erysipelas*, by aggravating her febrile symptoms, disturbing her sleep, and affecting the brain, very soon brought her to a state in which medical treatment was of little or no avail. After a combination of low delirium with stupor for four or five days, succeeding on the intense swelling of the face, with symptoms of extreme difficulty of respiration, tracheo-bronchial rattling, and incapacity to swallow, she died on the 9th of March, suffocated apparently by the constant accumulation of mucus from the back part of the nostrils upon the *glottis* and *larynx*.

Upon inspecting the body, a great quantity of viscid purulent mucus was found covering the posterior nasal cavities, the posterior *fauces*, *the glottis*, *epiglottis*, and *pharynx*. The *periosteum* of the nasal bones, of the upper part of the superior maxillary bones, where they form the floor of the orbit, and that of the superior and inferior spongy bones, was completely detached, and came away as if it had been subjected to long maceration or boiling. The *periosteum* of all these bones was very much thickened and extremely vascular; and, between it and its respective bones, purulent or sero-purulent fluid was interposed. The bones themselves, instead of presenting the usual bluish colour, were more or less white; and the upper part of the orbitar plate of the left maxillary bone, as well as the inside of both nasal bones, was of a dead white.

The membrane lining the *antra* of both maxillary bones was in like manner very much thickened, and covered with a viscid purulent secretion; and, when this was removed, it was found to be granular, villous, and much injected. This membrane also adhered very loosely; and, when an incision was made into it, it was found to be detached from the bony plate of the *antrum*.

These appearances showed clearly that the inflammation of the *periosteum* had destroyed the connection between the vessels of that membrane and the surface of the bones, and had thereby first interrupted the nutrition of these bones, and then produced their death, or *necrosis*. There is no doubt, that, eventually having now become foreign bodies, they must have been discharged in this manner from their situation; and there is also equally little doubt that, until this result was consummated, they must have maintained an inflammatory action and suppuration, or a series of actions, interrupted only or alleviated in their severity by the occasional escape of portions of bone of various sizes.

Permission to inspect the head was, from particular circumstances, not obtained. I had an opportunity, however, of inspecting the outer surface of each parietal bone near the tuberosities, to which chiefly the gnawing pains of the head were referred; and there, also, I found the connection between the *pericraniam* and parietal bones completely destroyed on the right side, and very much loosened on the left. The *pericranium* itself was thickened, and contained some serous infiltration. But the parietal bones presented no new deposition or irregularity of their surface. It was, however, though not so white as the bones of the nose and face, less blue than natural, and not completely dead. The anterior surfaces of both *tibiæ* were extremely rough and irregular, with deep longitudinal lines, presenting the worm-eaten appearance described by the older authors. These longitudinal depressions appeared to be formed in the substance of a new osseous deposit. The *periosteum* of these bones was thickened and indurated; but at the period at which I inspected it, it was impossible to say whether it had been preternaturally vascular or not.

This case I regard as particularly valuable for several reasons. It shows, in the *first* place, the true cause of *ozæna*, and the manner in which syphilitic or mercurial caries of the bones of the nose commences. That disease does not originate in the bones, but always begins in the fibro-mucous tissue which covers these bones, and by the vessels of which they are in a great measure nourished. I do not pretend to say whether this morbid action originates from the poison of *syphilis*, or the noxious operation of mercurial medicines; but one thing I know to be certain, from a considerable number of cases that have fallen under my observation, that the frequency of this disease of the *periosteum* is in the direct ratio of the quantity of mercury that has been taken, and the number of times that mercurial courses have been exhibited. The subject of the present case had been repeatedly under the influence of mercurial medicines; and though, like others, she had always derived from them immediate improvement, this was destined to be followed by an invariable aggravation of the periosteal disease.

Omitting, however, these considerations with regard to the cause, this case demonstrates unequivocally the nature of the action. It shows that the first step of the process is inflammation of the fibro-mucous membrane covering the facial bones; and that this inflammation commences most readily in those in which these two membranes are in immediate contact,—for instance, the inner surface of the nasal bones; the superior and inferior spongy bones; and the naso-palatine plate of the superior maxillary bone. The next step is the effect of this inflammation. The overloaded vessels are unable to transmit blood, as formerly, into the substance of the bone; they become detached, while they give rise to a new morbid secretion; the bone, in the meantime deprived of its ordinary nutriment, either becomes carious, or is killed outright, and is necessarily, after exciting much irritation, expelled as a foreign body.

This representation I have derived, not from the case of this woman alone, but from several similar ones in which I have had occasion to observe the same train of phenomena.

In the *second* place, it is worthy of observation, that periosteal inflammation produces two different effects,—one a detachment of *periosteum*, with death of the bone; the other a deposition of new bone, rendering the surface rough and irregular. The former action appears to be much more violent than the latter; and while the case of this patient presented both varieties of the action, the former in the parietal and facial bones, and the latter in both *tibiæ*, it was the former chiefly that produced with the *erysipelas* the fatal termination of the disease.

ART. IX.—*Case in which several Minute Calculi of a crystalline character were voided.* By NINIAN HILL, M. D., Senior Physician to the Greenock Hospital, and Member of the Royal Medical Society.—(In a Letter to the Editor of the Edinburgh Medical and Surgical Journal.)

I SEND you for analysis some urinary *calculi*, not being able to class them under any of the different forms of urinary deposits, as arranged by Drs Marcet and Prout. I cannot presume to speak decidedly of their nature, although from the appearance, crystalline shape, and the capability of scratching glass, I have every reason to think you will make them out to be silicious; consequently, a fourteenth species to the thirteen already known.*

Both Professor Thomson and Prout copy the analysis of urine as given by Berzelius, who notes *silica* as forming a small fractional part.

Fourcroy and Vauquelin are said to have detected the presence of *silica* twice out of 600 different specimens of urinary *calculi*. But Dr Prout, the latest and highest authority on the subject, at p. 28, 2d edit. doubts its existence either in the urine or in *calculi*, in the following terms:—“ Silex has been stated to constitute urinary sediment, and even to form a part of urinary *calculi* in some instances; but this assertion requires to be better authenticated than it is at present, before it can deserve credit.” He goes on to say, “ that Berzelius supposes it derived from the water which we drink, which is not improbable.” Dr Young in his sketch of animal chemistry, agrees with Dr Prout.

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* Prout, p. 86.

From these statements, it would appear that *silex* has never hitherto been discovered in a crystalline form, either in the urine, or in the state of a solid concretion.

These *calculi* were more transparent at first than now, having been put into a dressing-box, and subjected to friction from travelling while in the patient's possession. Two of the *calculi* are transparent, the third also; but it is imbedded in a dark-coloured body, not unlike *tuffa* or pumice-stone, * of which substance there are about ten or eleven deposits; while there is one evidently of lithic acid; but the description I must leave to you, or to some one versant in animal chemistry.

I subjoin the following account of the case furnishing these *calculi.*

A young lady, æt. 18, of delicate fibre, but very active, being out in the forenoon in perfect health, was suddenly seized while at dinner with general coldness, accompanied with vomiting, retching, and *tenesmus.* Neither the pulse or tongue were affected. The *abdomen* was acutely sensible to pressure, which enabled me to decide as to the case not being one of cholera, which was then epidemic, (21st March 1832,) her mother having just recovered from an attack.

The usual means for subduing peritoneal inflammation were put in force without affording relief. The pain continued still acute; but it became more concentrated over the hypogastric region. The body was bent forward, and the limbs drawn up close to the trunk; and all attempts to push them down caused great pain. Sir Astley Cooper says, this is when the calculus is passing over the lumbar *plexus* that the pain is felt in the groin, and in the course of the anterior crural nerve. Opiates had little effect; fomentations could not be endured from the extreme sensibility of the surface to the slightest pressure. The warm-bath gave decided relief so long as the patient remained in it. No urine was voided for thirty-six hours. It was scanty and high-coloured. The pain still continued violent, with a constant desire to make water, and from a throbbing sensation referred to the neck of the bladder, the patient feared some internal suppuration; but although the parts were very sensible to the touch, no fulness or swelling could be discovered. Anodyne *enemata* and opiate suppositories, in various forms, were had recourse to. But the frequent use of the warm bath was found to be the most effectual means of relieving pain.

As a considerable quantity of mucilaginous drink, containing carbonate of soda, had been taken, and no urine passed for hours, the catheter was introduced, when a quantity of pale urine, and a soft substance, with a small *calculus*, came away after the catheter, giving the patient immediate relief.

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* Silex is found in *tuffa.*—Ure's Dictionary.

On examining the *calculus*, I took it for a bit of white quartz. It scratched the window glass easily; and I hinted to the mother, who was in attendance, that it was foreign; but she said that was not possible.

The soft substance I found to be capsular, exactly like a stoned raisin, having its outer coat turned inwards, which was of a dark-brown colour, firm in texture, not easily torn; while the outer surface was of a pale-yellow tinge, pulpy and flocculent, as if it had been immersed in water.

The bladder having become unable to discharge its contents, the catheter was introduced three times in the course of the twenty-four hours. The attacks of pain were now less acute, though the sensibility to pressure continued much the same. In the morning two or three *calculi* of a dark colour, like bits of *tuffa*, followed the catheter, with the same kind of capsule as described, in which I have every reason to suppose the *calculi* were sheathed.

After a night of acute suffering, a clear shining sharp-pointed crystal followed the catheter, showing the error of my conjecture in regard to the origin of the first *calculus*.

The symptoms, as described, continued for ten or twelve days, till there were fifteen or sixteen *calculi*, and about six or seven capsules voided. The urine all the time was clear, and free of any thing like blood, mucus, or purulent matter. It was near a fortnight before the bladder assumed its power, or that the patient could stretch her limbs, so as to be able to stand upright; and the tenderness extended even to the *nates*, as to make it painful to sit. A dull pain remained fixed in the region of the right kidney for six weeks, although she was able to walk; yet she speedily recovered her florid complexion and strength.

Two months previous to this attack of illness, when on a visit to a friend in England, she was troubled with pain in the site of the right kidney; and the region was painful to pressure, but it did not prevent her riding or walking. This young lady's grandmother used to show a vial full of *calculi* which she passed; but I cannot learn of what species. Her father and two of her brothers are occasionally affected with nephritic pains, which are relieved by a course of carbonate of soda.

As all injuries and diseases of the spine are known to exert considerable influence on the urinary secretions, I must not omit to mention, that this patient had issues for tenderness of the dorsal *vertebræ* four or five years ago; and at another time she suffered so severely from a neuralgic affection of the head, that it impaired her vision for a time. I am induced to note these particulars, from Sir Gilbert Blane having remarked, that all substances found in the composition of stone, except the lithic acid, are the products of morbid irritation.

From the uneasiness felt in the region of the kidney for a length of time previous to the descent of the *calculi*,—from the great constitutional disturbance, and the acute neuralgic sensibility arising from mechanical irritation, which put on the character of abdominal inflammation,—we may be assured that these *calculi* are of renal origin. This case illustrates the mode in which the different *laminæ* of a *calculus* are formed; for here is an earthy deposit, then comes the coating of uric acid which formed the inner part of the capsule, while the pulpy and flocculent part would be the coating of animal matter making concentric *lamellæ*.

Greenock, 26th August 1833.

Observations on the Physical Character of the Calculi referred to in the preceding paper. By David Craigie, M.D. &c.; *with their Chemical Analysis*, by William Gregory, M.D., Fellow of the Royal College of Physicians, Edinburgh, and Lecturer on Chemistry.

Of the three bodies represented to be *calculi*, transmitted to me, the largest is an irregular hexaedral body, of a shade between umber-brown and chestnut-brown, rather inclining to the former, and of a resinous lustre. Of the six sides, one only has a crystalline appearance; and this, when examined by a good magnifying glass, is found to be irregular, with depressions and elevations. The greatest length of this body is about one-eighth of an inch; its greatest breadth about one-tenth; and its smallest breadth about one-twelfth. Most of its edges and angles are sharp; and it readily scratches glass. This body is opaque.

The second body, which is the next in size, is much more irregular in point of shape. It is rather larger than that last mentioned, and resembles an irregular shaped hexahedron, which has been pushed out of its rectangularity and made rhomboidal. Its colour is grayish-white, with a distinct quartzose lustre and aspect, and it resembles in all respects a bit of quartz. It is translucent chiefly at the edges, not transparent, as stated by the author. Its surface is rather rough, with inequalities, but has the aspect of having been rubbed down and made smoother.

The third body, which is smaller, more taper, and acuminated at the two extremities, is of a white colour, and presents still more distinctly the quartzose aspect and lustre. This body, which, like the last, is translucent, is about one-tenth of an inch long, and one-twentieth broad in the middle, and is of a pyriform shape, resembling two irregular cones united by their bases.

As I was desirous to obtain the best authority on the chemical constitution of these bodies, before making any statements regarding their nature, I placed them in the hands of my friend Dr William Gregory for chemical analysis, and soon received from him the following note.

My Dear Sir, *27th November* 1833.

I have examined the two larger *calculi* you gave me. They consist of *silica*, as may be seen by the following experiments.

They are infusible before the blowpipe *per se*. With soda, they melt with effervescence into a glass. When this glass is decomposed by an acid, a gelatinous precipitate is formed. Finally, a portion, reduced to powder, and heated in contact with hydrofluoric acid, disappeared entirely.

The extreme hardness of these *calculi*, and their siliceous nature, render it in my opinion extremely improbable that they should have been formed within the bladder; at least the evidence should be very clear and decisive before we admit such an origin for these calculi.—I remain, Dear Sir,

William Gregory.

I have now to observe, that the analysis here given renders it extremely doubtful whether these *calculi* could have been formed even in the kidneys. The only authentic instances of siliceous urinary *calculi*, excepting the siliceous gravel mentioned by Dr Venables of Chelmsford, are the three instances recognized by Dr Yellowly and Mr Faraday, in the analytical examination of the collection of the Norwich Hospital, (Ed. Med. and Surgical Journal, Vol. xxxv. p. 433.) In these the siliceous particles were neither *alone* nor *massive*, but associated with other substances, through which they were *disseminated*. In two cases they were associated with, and disseminated through, oxalate of lime,—and in the third, phosphate of lime and lithic acid. In the present case the siliceous portions are *massive*, not *disseminated*; and though they appear to have been inclosed in other substances, it may be doubted whether this character would assimilate them sufficiently to those of the Norwich collection to justify their being recognized as genuine urinary *calculi*.

It is at the same time possible that the kidneys may secrete pure *silica* in certain states of the system. But, upon the whole, the authenticity of the present case, as an example of urinary *calculi* of silicious composition occurring in the kidneys of the human body, must rest on the personal observation of Dr Hill, and the credibility of his patient.

ART. X.—*Observations on the Treatment of Tic-Douloureux, illustrated by Cases.* By JAMES RANKINE, M. D. Licentiate of the Royal College of Surgeons of Edinburgh.

IT appears, by a question, "*Utrùm in pertinacibus capitis faciei doloribus aliquid prodesse possit, sectio ramorum nervi quinti paris? proponebat Viellart,* 1768. *Conclusio negativa,*" proposed before the Faculty of Medicine of Paris in 1768, that *Tic-Douloureux*, the *Trismus Dolorificus* of Sauvages, had been noticed at a period rather earlier than this. A description of an operation for its relief, by M. Louis, is given in No. 36 de la Gazette Salutaire, 1766. The first good description of its phenomena, however, under the name of *Faciei Morbus Nervorum Crucians,* was given by Dr Fothergill so late as 1776.* Since that time it has been noticed by Darwin and others;† and at present it is of frequent occurrence.

The seat of *tic-douloureux* is generally confined to the nerves of the face, being branches of the fifth pair, and occasionally to the *portio dura* of the seventh pair. It has been conveniently divided, therefore, according to the part which it affects, into four species, the *frontal*, the *infra-orbitary*, the *maxillary neuralgia*, and the *neuralgia* of the *facial* nerve. It sometimes, however, although more rarely, affects other parts of the body, to distinguish which, Dr Mason Good, in his Nosology, notices three species, the *neuralgia faciei, pedis,* and *mammæ.* Mr Abernethy mentions having met with it in the ring-finger.

The disease is characterised in its severest form by paroxysms of excruciating pain, plunging, as has been well observed, like an electric shock, in a manner similar to no other disease. These paroxysms last for an indefinite period of time, and are then succeeded by a period of almost entire freedom from pain, until the accession of a fresh exacerbation. This paroxysmal exacerbation appears to consist of a strong spasmodic affection of the physical structure of the nerve; the interval of a state of repose following as a consequence of the previous exhaustion, which continues until the vital energy of the part has been again sufficiently recruited to undergo a repetition of the phenomena. These are also sometimes attended with convulsive twitches in the muscles.

Of the cause of this painful and distressing complaint we are in a great measure ignorant; for although there are instances on record which appeared to be the consequence of external violence, wounds, and contusions, yet there are many examples, and these by far the greater number, of the disease having occurred without any such causes. This at least shows that some other agent may produce it. Sir Henry Halford has thrown out a suggestion, that "the disease is connected with some preternatural growth of bone, or a deposition of bone in a part of the animal economy, where it is not usually found in a sound and healthy condition of it, or with a diseased bone."* And along with this suggestion, he has stated several remarkable cases, apparently giving great weight to it. I doubt, however, if the *tic-douloureux* was fairly to be attributed to the destruction or formation of the bone as a cause. From the long standing of the disease in the instances referred to, I am more inclined to look upon the circumstance as a result of the affection of the nerve itself; but, be this as it may, it will at most only act as an occasional cause, operating somewhat in the same manner as wounds and contusions, which, however, are more apt to give origin to *tetanus* than the disease under consideration. The great source of this disease, nevertheless, seems to be in some irritation in contact with the nervous system of the face, and occasionally of other parts of the body; and it is the want of a true knowledge of the locality of this irritation which has hitherto rendered *neuralgia* so perplexing.

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* See Medical Obs. and Inquiries, Vol. v.

† Dr Darwin was born in 1731, and died in 1802.

That it has not its origin in the brain, the failure of the attempt to cure by cutting the nerve betwixt the seat of disease and the issue of the nerve from that organ, affords sufficient proof; nor is it local, as appears from the success of the remedies, which are not calculated in so short a period to remove a mere local disease, that is, a disease having its origin in its seat, as endeavoured to be established by Sir Henry Halford. I presume, therefore, that the true source of the irritation is at the sentient extremities of the nerves; and, in truth, in ninety-nine cases out of an hundred the disease does not arise from mere local affection, but has its origin in some cause far distant from where it is developed. This is, moreover, a true principle of action in many diseases, and therefore I have been induced, in consequence of the result of a method of treatment which it is the principal object of this paper to communicate, to attribute, and with some degree of probability, the whole phenomena to an irritation, the result of a peculiar and unhealthy action in the digestive organs, acting upon their sentient nervous filaments. It is difficult, I am aware, to establish this, for the idea is not new, and has often been acted upon, though frequently unsuccessfully. It is almost unnecessary, I apprehend, to mention the intimate connection which exists between the nerves of the face and the abdominal viscera.

I.—A. B. aged 27, May 13, has an excruciating pain over the upper eyebrow of the left side, confined to the space of about two inches above the supra-orbitary notch. Pain not constant, but comes on about noon, and decreases as the evening advances. Came on about five days ago. Eye not affected; no twitchings, no swelling, colour natural. Has applied leeches without effect. Health, he says, is good; of a studious habit, dark complexion. Has been taking castor oil at the recommendation of a druggist.

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* See Essays and Orations, read and delivered at the Royal College of Physicians, by Sir Henry Halford, Bart. M. D. &c.

℞. *Tinct. Opii*, ʒss.; *Liq. Acet. Ammon.* ʒj.; *Camphoræ* ℈j.; *Ol. Oliv.* ℥j.; *M. Ft. Linimentum bis terve in die partibus perfricand.*

℞. *Extr. Conii Mac.* gr. xij.; *Hydr. Submur.* gr. vj.; *Pulv. Calumbæ* ℈j.; *Extr. Gentian.* q. s. *Ft. Massa Pilulas* xij. *divid. sumat* j. *bis in die.*

Friday, May 18, feels completely relieved.—*Continuentur pilulæ paulisper diutius.*

About three years after this, the same gentleman experienced a similar attack, which was, however, much milder, and yielded in a few days to the same remedies.

II.—C. D. aged 26, of a quiet disposition and sluggish circulation, is afflicted with severe pain over the right eyebrow, and shooting down deeply behind the eyeball, with considerable redness of the *conjunctiva*, and an increased secretion of tears. Came on three or four days ago, and has since increased. No headach; pulse unaffected; no pyrexia; tongue whitish. Had lately undergone a regular course of mercury for the secondary symptoms of *syphilis*, but is now quite free from that disease; and, except for the affection of the eyebrow, says he is quite well. Pressure upon the part relieves the pain. Was ordered to apply half a dozen leeches to the temple, and to take the following pill at bed-time.

℞. *Hydr. Submur.* gr. iij.; *Extr. Hyoscyami*, gr. ij.; *Carb. Ferri*, gr. v. *M.*

December 24. Eye relieved, but pain of forehead still continues, though more confined to the eyebrow. To be rubbed every three or four hours with the following liniment:—

℞. *Extr. Hyoscyami*, ʒj.; *Aq. Font.* q. s. *ad formand. Liniment crassitud. mellis.*

The liniment not applied on account of its colour, being obliged to go to Birmingham (43 miles) on business in the evening. He was therefore ordered to rub the part with the following:—

℞. *Camphoræ* ʒj. *Ol. Oliv.* ʒvj. *Tinct. Opii*, ʒij. *Ft. Linimentum.*

December 28. Returned from Birmingham worse than before. He had been forced to apply while there for assistance, but without avail. The eye very red, and constantly weeping;

little intolerance of light. Ordered the temple to be again bled with leeches, and a blister to be applied. The following purging powder to be taken in the morning:—

℞. *Hydr. Submur.* gr. v.; *Pulv. Jalapæ,* gr. xv. *M.*

December 29. Eye not much relieved. Ordered to use the hyoscyamus liniment, and the following mixture to be taken every three hours:—

℞. *Sulph. Magnes.* ʒx.; *Infus. Ros. rubr.* ℥vss.; *Pulv. Ipecac.* gr. x.; *Ft. Mist. Coch.* ij. *ampla pro dosa.*

To take the following draught at bed-time.

℞. *Tinct. Opii.* gtt. xl.; *Vini Antim.* gtt. xxx.; *Aq. Cinnam.* ℥j. *M.*

December 30. Bowels confined; pain better; eye clear, without intolerance of light.

℞. *Infus. Sennæ,* ʒiss.; *Sulph. Magnes.; Mannæ opt.* aa ʒj.; *Tinct. Rhei,* gtt. xv.; *Ft. Haustus; mox sumendus.*

Sent for in the evening, a most violent paroxysm of pain having come on. The *conjunctiva* injected, and the eye weeping copiously. Ordered the same liniment as for A. B., to be well rubbed over the seat of pain, and one of the pills, as for do. to be taken twice a-day.

January 1. Half an hour after the application of the liniment the pain moderated.

Evening. Has had four of the pills, and feels greatly better; the pain only coming on about every three hours, which is immediately relieved by the application of the liniment.

January 2. Feels much better altogether; very little pain, and referred to the upper eyelid and outer corner of the eye. The vessels of the *conjunctiva,* and inner side of the lower eyelid especially, numerous and enlarged, and of a scarlet colour, with copious secretion of tears when the eye is touched. In other respects the eye natural, and no intolerance of light, or weakness, or dimness of sight. Has had five pills.—*Continuentur Pilulæ et Linimentum.*

January 5. Improving rapidly. Had only one slight twinge yesterday evening, at which time it has always been most violent.

Take one pill every afternoon; continue the liniment if pain should come on. Bowels open.

January 7. Has had no paroxysm since last noticed, and feels very little inconvenience.—Continue the one pill a little longer.

January 10. Has been perfectly well since last report, and continues so.

N. B.—One year after this, C. D. had a similar attack in the other eyebrow, attended with most excruciating pain, which, by the same mode of treatment, got perfectly well in seven days.

III.—E. F. aged 46, of a fair complexion, and rather delicate, is labouring under a most excruciating pain, which makes him stagger like a drunken man, over and about the right eye, attended with a thin fetid discharge from the right nostril, was affected with these symptoms, accompanied with twitchings of the face, first about five weeks ago; but, after taking a solution of the sulphate of magnesia in infusion of roses three times a-day for sometime he got better; but the disease has returned more violent than ever, and he obtains no relief from the medicine as before. The pain generally continues very severe for four or five hours, then remits, and sometimes entirely disappears until next day, when it returns with its usual violence. Eye not inflamed, but when opposed to the light feels rather tender. Tongue rather foul; pulse small; bowels open. Was bled before I saw him with leeches on the temple, but feels much worse since.

Take one of the pills twice a-day, as for A. B.

October 17. Has had another severe attack of pain this morning, but is now better.—To use the liniment as for A. B. and in the same manner.—*Sumat æger* ℈ii. *Pulv. Jalapæ comp. cras mane.*

October 18. Has had no severe attack of pain since yesterday, and feels comparatively easy; nothing but a feeling of soreness being present. Bowels opened by the powder; pulse 90, pleasant; running from nose continues, and is very fetid; in amount about a table-spoonful in twenty-four hours; is now rather thicker; has taken four pills.—*Continuentur Pilulæ et Linimentum.*

October 19. Continues better.—*Continuentur.*

℞ *Sulph. Magnes.* ℥ss.; *Aq. Menth. pip.* ℥iss.; *Spt. Eth. Nitr.* gtt. v. *Ft. Haustus, mane sumendus.*

October 20. Is free from pain, and feels nothing but a little cuticular soreness of the upper eyelid; medicine has operated once; discharge from the right nostril continues; has taken eight pills.

October 21. Has called to say he is quite well.

IV.—G. H. aged 50, of a thin, spare, and dried habit of body, suffering frequently from affections of the stomach and liver, during the night, was attacked with an excruciating paroxysm of pain, plunging "like a dagger" behind the right ear; has often had toothach, but it far exceeds any pain she ever suffered from that disease. Pulse natural, and has no other complaints except windy belchings from the stomach. Bowels regular; tongue whitish; and covered thinly with a thick creamy-like mucus; suffers very little pain, except during a paroxysm, which generally comes on at night, towards the morning.

To have a pill twice a-day as A. B., and foment the part with a strong decoction of poppy heads.

October 4. Has had two paroxysms this morning early, but not severe. Bowels open.—*Continuentur.*

October 5. Has had other two attacks this morning, but so trifling that she considers herself nearly well. Had four stools yesterday, and thinks it is from the pills.—*Continuentur.*

October 6. Free from pain, but complains of a little stiffness. Take one pill once a-day.

October 10. Quite well.

Of a fifth case I have lost the notes, which I particularly regret, as the case was a very severe one, of long standing, and the patient, a female, almost worn out with pain and suffering. The same remedies, however, were applied, and with complete success. The disease was situate in the *portio dura.*

What is to be remarked in this treatment is its simplicity, permanency, and great success. Those medicines which have hitherto been used most successfully are, quinine, opium, mercury, and the carbonate of iron, together with sea air, exercise, and attention to the general health. All of them have a tendency, more or less, to improve the secretions; and more especially the most successful of them, the carbonate of iron. Those drugs on which I place dependence, and which seem to act as a specific, are hemlock, calomel, and calumba root. What then is the action of these remedies?

Hemlock extract is a powerful anodyne, abating pain without producing costiveness, and has been used with great success in many painful diseases,—as cancer; it has also been used in chincough, where it has a wonderful effect in allaying the spasmodic paroxysm, and in other spasmodic diseases.

Calumba is a powerful antiseptic and bitter, and an excellent tonic, and has a particularly good effect in cases of biliary derangement, especially cholera and bilious remittent fever, and for this purpose is much used in India. It is also a most excellent remedy in several forms of *dyspepsia.*

Calomel is a remedy of almost universal application, and by proper management may be made to increase almost any of the secretions or excretions;—possessing a specific action on the liver, and a powerful effect in allaying biliary irritations,—in such cases removing uneasiness, and acting as an anodyne better than opium itself, or any other sedative.

The operation of these combined remedies, therefore, is to improve the secretions, open the bowels, and relieve pain. In this instance, they cure, by allaying the increased sensibilities of the nervous filaments of the stomach and *duodenum*, ameliorating the acrimonious secretions poured into them, carrying the feculences downwards, and improving and bringing to a healthy state the vital process of chylification. Thus I would regard *tic-douloureux* as a spasmodic affection, having its origin in a certain irritation developed in the digestive organs.

That excellent observer, Dr Hamilton, in his observations on *chorea*, sufficiently proves that irritating matters in the intestinal tube are sufficient to produce disease of a most virulent kind. He also proves how insufficient mere stimulant and sedative remedies are in diseases arising from irritative accumulations; and hence we are led to understand the hitherto ineffectual practice pursued in the cure of *tic-douloureux*. It is of no use to reply that purgatives have been tried and have failed. The success of the above practice amply shows what a proper selection of remedies can effect in that way;—for what avails it merely to remove unhealthy collections without at the same time destroying the cause which first produced, and then kept them up? The case No. III. shows distinctly that the disease did not arise from a local cause, as Sir Henry Halford would immediately have fancied, notwithstanding the undoubted existence of osseous disease. Moreover, the disease sometimes spontaneously disappears, without any apparent reason.

The seasons of accessions and intervals of pain are more difficult to account for on the above principles, and I cannot resolve the difficulty in any other way than by supposing that these took place when the stomach was most empty, and therefore less protected against the peculiar irritation; the accessions occurring as in Nos. I. and III. three or four hours after breakfast; in No. II. the same number of hours after dinner; and in No. IV. when the pain occurred in the morning, the woman generally took heavy meat suppers.

To the liniments I attribute little besides the effect of friction, and the keeping the mind of my patient easy, under the apparent trivial treatment of so painful a disease.

ART. XI.—*Observations tending to elucidate the question, Is it possible to discover by Auscultation which side of the Heart is the diseased one, when Hypertrophy or Dilatation, or both, exist on one side of the organ alone?* By ROBERT SPITTAL, M. D., one of the Physicians to the Western General Dispensary, &c.

AUSCULTATION, as a means of diagnosis in diseases of the heart, is surrounded by a degree of difficulty and uncertainty seldom to be encountered in the application of the same means in the diagnosis of other affections of the chest; and this in a great measure depends on the fact, that the physiological action of the organ still remains to a certain extent a matter of great doubt. These remarks apply with considerable force to the subject which we propose to consider in the following pages, viz. whether the signs perceived in the right and left precordial regions by auscultation are caused by, and indicative of the condition of the right or left side of the heart?

The physiological action of the heart, according to Laennec,—"is only felt in the cardiac region; that is, the space comprised between the cartilages of the fourth and seventh ribs, and under the lower end of the *sternum*. The motions of the left cavities are chiefly perceptible in the former place; those of the right cavities in the latter. This is so much the case," continues he, "that in disease of one side of the heart only, the pulsation in these two situations gives quite different results."* Again, "the impulse of the heart's action is usually perceptible only over the region of the heart, or at most over the inferior half of the *sternum*." † And farther on he observes, that "the sounds heard at the end of the *sternum* are produced by the action of the right side of the heart; those between the cartilages of the ribs by the left cavities. In a state of health the sound produced by the contractions of each side is the same; in certain states of disease, on the contrary, the sound of the two sides becomes quite dissimilar." ‡

Such are the decided statements of Laennec, contained in his unrivalled work on auscultation, in which, although more recent researches have detected occasional inaccuracies, still these have in no way diminished the admiration so justly due to that truly original and useful production. On the contrary, we are astonished at the accuracy with which so many new facts have been communicated to the world.

Perhaps the most important error, as yet, or that ever will be discovered, in the work of Laennec, is that relating to the rhythm of the heart's action, first observed by Professor Turner, and now almost generally admitted; and we take occasion to mention this inaccuracy, merely to show how errors of very great importance may be overlooked and perpetuated; while, at the same time, a little observation on the part of any one accustomed to such researches might easily, in many instances, prove them to be without foundation.

In the following observations, it is our intention to point out, if not an error in diagnosis, at least a hasty and rash induction from a few facts,—certainly from very insufficient data. We are not prepared to acquiesce in the statement so generally admitted, that it is possible to distinguish by auscultation the movements and sounds of the different sides of the heart either in health or disease; and it does not appear difficult to show that this cannot always be done, and that there is a very great want of evidence from which to draw a satisfactory conclusion on the subject.

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* Laennec's Treatise, by Forbes, p. 548. † Op. cit. p. 553. ‡ Op. cit. p. 555.

In regard to the physiological action of the heart, we are ready to admit that the sounds and impulse of that organ can be perceived in the site originally pointed out by Laennec, viz. the precordial region; but we are not prepared to admit that the sounds and impulse perceived in what is termed the left precordial region are produced by the left cavities; or that those perceived in the right precordial region are produced by the right cavities. Of this there seems to be no distinct proof; and it is more likely that the sounds and impulse are mingled together, and presented to the ear of the observer *en mass*, as remarked by a recent writer,* so as at least to render it a subject of doubt whether it be possible to separate them; and when we come to examine the same indications in a pathological state of the organ, we shall find additional reasons to doubt of their accuracy.

In hypertrophy of the ventricles of the heart, says Laennec, "the contractions of the heart, as explored by the cylinder, give the same results precisely, whether the hypertrophy be on the right or left side; only, in the former case the shock of the heart's action is greater at the bottom of the *sternum* than between the cartilages of the fifth and seventh ribs, which is the reverse of what happens when the disease is on the left side of the organ." Again, he adds, "I consider this sign drawn from the place where the heart is heard and felt beating with most force, as altogether certain. I have proved its truth so often by dissection, that I look upon it as infallible when well-marked." †

In dilatation of the left ventricle, the same author remarks, that "the only certain sign of the existence of this disease is that given by the stethoscope, viz. the clear and sonorous contractions of the heart between the cartilages of the fifth and seventh ribs;" ‡ and in dilatation of the right ventricle, "the only constant and truly pathognomonic sign is the loud sound of the heart perceived under the lower part of the *sternum*, and between the cartilages of the fifth and seventh ribs of the right side."§ Again, in cases of dilatation with hypertrophy, "the examination of the actions of the heart, first on the one side, and then on the other, that is, under the lower part of the *sternum*, and between the cartilages of the fifth and seventh ribs of the left side, enables us to ascertain precisely which of the ventricles is affected, if there is only one; or, if they both are so, which is more commonly the case." || And in the chapter on dilatation of one of the ventricles, with hypertrophy of the other, the same author observes, that "the comparative exploration of the two sides of the heart is a certain means of ascertaining every complication of this kind that can take place." ¶

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* Instruction Pratique, &c. par M. Corbin. Paris, 1831. P. 38.

† Forbes' Laennec, p. 602. ‡ Op. cit. p. 605. § Op. cit. p. 606.

|| Op. cit. p. 609. ¶ Op. cit. p. 610.

Lastly, in treating of the rhythm of the heart, we find the following passage:—" When only one of the sides of the heart is affected, and more particularly in the case of contraction of the orifices, the rhythm, the sound, and the impulse of the sides, may differ so much as to occasion results that might be attributed to two different hearts." *

These statements of Laennec have been more or less adopted by almost every writer on auscultation since the time of that author; but, whether from conviction,—the result of personal observation,—or merely from reliance on the accuracy of the original and enlightened observer,—will afterwards be seen when we come to look for evidence on the point under consideration.†

It is evident, from a perusal of these observations taken from the work of Laennec, that the learned author had formed a very decided opinion on this subject, viz. that it is possible, by auscultation, to tell which side of the heart is the diseased one, whether this be hypertrophy, or dilatation, or both. We do not mean to say, however, that auscultation is regarded as the only means of diagnosis in such affections. On the contrary, Laennec, and several of the authors alluded to above, press upon us the necessity of looking to the general symptoms in the formation of a diagnosis; still at the same time the stethoscopic indications are held forth as of the first importance.

Now, although auscultation by no means always reveals the condition of the heart in a general way, in reference to the more ordinary affections, such as hypertrophy and dilatation—the opinion of Andral and others being now very generally admitted, viz. that, when the signs of such affections exist, it is in general just to conclude that the disease exists also; but the absence of such signs by no means indicates the non-existence of disease. Still there can be no doubt, that very great assistance is rendered by auscultation in by far the majority of cases,—not by informing us that one or other ventricle is diseased, but in a general way indicating enlargement, diminution, hypertrophy, or dilatation of the organ, and this in reference entirely to the ven-

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* Forbes' Laennec, p. 563.

† The following are the authors alluded to who have all more or less adopted the opinion of Laennec:—H. C. Van Hall, de Stethoscopii in Morbis Pectoris usu. Trajecti ad Rhenum, 1823.—Traité des Maladies du Cœur, &c. par R. J. Bertin, &c. Paris, 1824.—Original Cases, &c. by John Forbes, M. D. London, 1824.—An Introduction to the Use of the Stethoscope, by William Stokes, M. D. Edinburgh, 1825.—Memoire sur le Diagnostic des Affections Aigues et Chronique des Organes Thoraciques, par Elie Gintrac, M. D. Louvain, 1826.—Clinique Medicale, Maladies de Poitrine, par Andral. Paris, 1826.—Traité Elementaire de Diagnostic, &c. par M. L. Rostan. Paris, 1826.—Lumleyan Lectures, by Dr Elliotson. London, 1830.—Des Diverses Methodes d'Exploration de la Poitrine, &c. par V. Collin, M. D. Paris, 1831.—A Treatise on the Diseases of the Heart and Great Vessels, by J. Hope, M. D. London, 1832.

tricles; for, as to the diagnostic signs of similar affections of the auricles by auscultation, we know nothing.

Thus far we are willing to go; and we also admit, that the peculiar indications of the action of the heart may vary their site, so as in one case to be more distinctly perceived at one part of the precordial region than in another. But this, as remarked by M. Corbin, with whom we are very much inclined to agree, does no more than point out the space in which the pulsations of the heart take place; and the more or less extended from this space indicates, in a general manner, hypertrophy or dilatation, without permitting us to designate the special site of the disease.*

We shall now bring forward various statements and facts in support of the views adopted in this paper, which seem quite at variance with the opinion of Laennec and others. This will be chiefly drawn from the writings of the most eminent authors who have written on this subject; and, according to seniority of publication, Bertin is the first we shall notice. In that author we find the following remarks:—"Dans les cas d'hypertrophie des parois du ventricule gauche seulement, cette cavite parait constituer le cœur tout entier, et le ventricule droit ne semble qu' une sorte d'appendice de l'autre, comme celui-ci s'etait hypertrophie aux depens du droit. Quand le ventricule droit est epaisse, par example, le gauche, moins ferme et moins robuste que dans l'etat naturel, se rapproche de l'etat normal du ventricule droit. Ce qui a fait supposer, dans ses cas, une espece de transposition de ces organes. Quel que soit le ventricule hypertrophie, on remarque que sa pointe descend plus bas que celle de l'autre." † In the article on malposition of the heart, the same author observes:—"Nous avons rapporté des cas ou le cœur etait situe transversalement dans le cavite thoracique; et nous avons dit que ce vice de position se rencontrant souvent dans les cas d'hypertrophie et de dilatation considerable du cœur." ‡ And again, "D'autres observateurs ont trouvé le cœur situé perpendiculairement, comme celui des quadrupedes. Les examples de veritable deplacement du cœur ne sont pas tres rares."§

In the work of Laennec we find the following remarkable passage, being a portion of the same paragraph, in which he states, that he considered the site in which the action of the heart is perceived, a sign, not only as altogether certain, but infallible when well-marked, viz. "nevertheless there is still one exception to this rule. When the left ventricle has acquired an enormous size from hypertrophy and dilatation, and the right still remains small, the former becomes quite anterior, and the last posterior. In this case the pulsations of the left ventricle are perceived much better under the sternum than in the left precordial region; while those of the right are not perceived at all."[*] Again, in considering displacement of the heart, we have the following passage. "When the heart is enlarged, its point is carried to the left, and the auricles to the right side,—in such manner, that it comes to lie almost transversely across the chest. This observation has been made by M. Bertin, and I have myself often proved its accuracy."[†]

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* Op. cit. p. 51. † Bertin, p. 344. ‡ Op. cit. p. 441. § Op. cit. p. 442.

It is well known that various confident statements, made by Laennec in the first edition of his treatise, published in 1819, were very much modified, if not abandoned, in the second, published in 1826. The present quotation shows this. In both editions we find the passage formerly noticed, announcing the infallibility of certain signs occurring in a particular site, as diagnostic of disease of one or other side of the heart; but in the second edition, this statement is qualified by the addition of the first paragraph noticed.[‡] The second paragraph,[§] in corroboration of Bertin, is only to be found in the latter edition, from which also all the previous quotations from that author have been taken. These, as well as other instances, might be mentioned to illustrate a want of caution, to a certain extent, in the enlightened observer, in originally drawing his inductions from the facts before him.

Much attention to the diagnosis of diseases of the heart has been given by Dr Elliotson; and in his work we find the following remark:—"When the left ventricle is severely affected with hypertrophy and dilatation, its violent pulsations are felt, not merely in the left lower half of the cardiac region, but also under the *sternum*, and even to the right of this bone."[‖]

The last author we shall notice is Dr Hope, whose work is perhaps the ablest on the subject in the English language. In it we find the following observations:—"The left ventricle being more prone to thickening, and not less to dilatation than the right, sometimes attains a volume seldom or never acquired by the right; and when its enlargement is enormous, it occupies not only the left precordial region, but extends far under the *sternum*, when its impulse and sound may be mistaken for those of the right ventricle."[¶] In another memoir on hypertrophy of the heart, the same author remarks,—"that, when all the cavities are hypertrophous, and at the same time dilated, the heart attains a volume two, three, and occasionally even four times greater than natural; its form, instead of being oblong, is spherical; its apex is scarcely distinguishable; and as the diaphragm does not retire sufficiently to yield space downwards for the enlarged organ, it assumes an unnaturally horizontal position, encroaching so far upon the left cavity of the chest, as sometimes to force the lung upwards as high as the level of the fourth rib, or even higher." *

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[*] Forbes's Laennec, p. 603.
[†] Op. cit. p. 627.
[‡] Op. Cit. p. 603.
[§] Op. Cit., p. 627.
[‖] Lumleyan Lectures, p. 27.
[¶] Hope, p. 183.

These extracts sufficiently show that the distinguished authors, from whose works they have been taken, were quite aware of the fact, that exceptions existed to the general rule which they had adopted in regard to the diagnosis of the different sides of the heart by auscultation; but it seems they did not consider these exceptions sufficiently numerous and important, to disturb the general accuracy of the opinion they had formed. The collective evidence contained in the observations just quoted, however, is quite at variance with such an opinion; for it is evident that, under the circumstances mentioned, the diagnosis would be at least rendered exceedingly doubtful in many such cases, and altogether erroneous, and the reverse in some; and there is reason to suppose, that, were this subject more attended to, such exceptions would be more frequently observed. As it is, these appear sufficiently numerous, and, when taken together, with the very slender evidence which shall be presently noticed in support of the opinion at present combated, are quite enough to render the general truth of such an opinion at least very doubtful.

The following is the most remarkable case bearing upon the subject which has yet come under our notice. It occurred some time ago in the Royal Infirmary of this city, and is remarkable for the existence of great disease of one side of the heart, with distinct stethoscopic signs of an affection of the opposite, according to the ordinary physical signs, as laid down by almost every writer on this subject.—W. P., a man ætat. 24. Action of the heart loud, and irregular in strength and frequency. Impulse much stronger than usual, and perceived most distinctly between the fifth and sixth ribs,—more to the left than usual. The pulse at the wrist is feeble and intermitting. There is no *bruit de soufflet* or other morbid sound heard during the action of the heart.

Dissection.—Heart enlarged, and lay more obliquely to the left in the chest than usual, its apex pointing between the fifth and sixth ribs. The left ventricle was rather below the usual size and thickness, very flabby and soft, so that it collapsed on being cut into. The right ventricle, on the contrary, was much di-

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* Article Hypertrophy, Cyclopædia of Pract. Med., Part xi. p. 536.

lated, and its walls in a state of considerable hypertrophy; its *columnæ carneæ* were also much enlarged. The walls of this ventricle were much firmer than usual, so that they did not collapse on being cut into, and even yielded a somewhat hollow sound when struck with the scalpel. The extremity of this ventricle, twisted round to the left, formed the apex of the heart. The mitral valve was very much diseased; its two segments were united for a considerable way at each side by a cartilaginous deposition, which had likewise involved some of the *cordæ tendineæ*. By this disease of the valve, the left auriculo-ventricular opening was so much narrowed, that it could only admit the point of the little finger. There was slight dilatation and thickening of the walls of the left auricle; and here and there, on its inner surface, small earthy scales were observed.

In this case the right ventricle had, as it were, changed places, to a certain extent, with the left. Its great enlargement seems to have forced the heart more to the left side of the *thorax* than usual, in all probability from not having met with a corresponding nutritive, and consequent physical, force on the left side of the organ, which, there is every reason to suppose, had it encountered, viz. a state of hypertrophy, with dilatation of the left ventricle, the direction of the organ would not have been changed. That this is the way in which the change of direction has taken place, appears very probable; and it is stated in the case, that the left ventricle was soft and flabby, and rather below its usual size; it was, therefore, in a very fit condition to be so acted upon by the right ventricle. The direction of the apex of the heart seems to be maintained in its proper position principally by the integrity of its ventricles.

The signs of auscultation in the present case, according to the opinion of Laennec and others, were unequivocally those of hypertrophy and dilatation of the left ventricle, with no indication whatever of the right being affected at all; while on examination after death quite the reverse was found to be the case. The impulse, instead of being at the lower part of the *sternum*, as it is said it will be found in such cases as the present, was perceived rather more to the left of its usual position in health; and when we consider the softened state of the left ventricle, and, on the contrary, the hypertrophied, dilated, and indurated condition of the right, we cannot have the slightest hesitation in attributing the strong impulse to the latter, independently of the position which the heart was found to have assumed, and which was revealed by dissection. Farther, it may be mentioned, that the examination of the body took place only fifteen hours after death, so that the softening of the left ventricle cannot be attributed to incipient decomposition. Moreover, both

IMPULSE	SOUND.	DIAGNOSIS.	AUTOPSY.
16. Strong in right precordial region; less in left.	Sufficiently marked in right region; louder in left region.	Hypertrophy with dilatation of heart, especially of right side; afterwards hypertrophy of right side.	Dilatation and thinning of left ventricle; hypertrophy and dilatation of right ventricle.
47. Strong in both precordial regions.	Obtuse; loudest in left region.	Hypertrophy of both ventricles.	Hypertrophy and dilatation of both ventricles.
49. Very strong in left precordial region; moderate in right region.	Sufficiently loud in left region; moderate in right.	Hypertrophy of heart.	Great hypertrophy and dilatation of left ventricle; slight dilatation of right.
49.* Sufficiently strong in left region.	Not very clear in left region.	Hypertrophy and dilatation of left ventricle.	Considerable hypertrophy and dilatation of left ventricle; slight hypertrophy of right.
50. Strong in left region.	Moderate in left region.	Hypertrophy of left side of heart.	Hypertrophy of left ventricle.
51. Strong, concentrated, in left region.	Dull in left region.	Hypertrophy of left ventricle.	Great hypertrophy of left ventricle.
3. Great.	Loud, especially at right side of *sternum*.	Dilatation, with hypertrophy of heart. Dilatation especially of right cavities.	Hypertrophy and dilatation of left ventricle; dilatation of right, and greater than in left.
7. Slight in cardiac region.	Diffused, and heard most distinctly in right region.	Hypertrophy, with dilatation (of one or both?) the ventricles.	Considerable dilatation and hypertrophy of left ventricle; slight hypertrophy of right ventricle.
1. Strong in left region.	First dull; second loud.	Hypertrophy with dilatation.	Immense hypertrophy of left ventricle; considerable of right; both dilated.
2. Increased in force and extent.	Loud prolonged murmur in left region.	Organic disease of heart.	Simple hypertrophy of left ventricle.

7. Increased in left region; weaker in right.	Diffused, short, flat.	Dilatation of left ventricle, with thinning of walls.	Considerable dilatation of left ventricle; walls natural; less dilatation of right; walls natural or thinner.
9. Feeble.	Clear and short; loudest in left region.	Dilatation of heart.	Slight dilatation of right ventricle; walls of left ventricle thinner than natural, not dilated.
16. Tumultuous, diffused, & most felt in right region.	Diffused.	Hypertrophy and dilatation.	Dilatation of both ventricles; walls natural.
18. Diffused.	Most distinct in right region.	Dilatation of heart, particularly on right side.	Dilatation and hypertrophy of right ventricle; dilatation of left ventricle; walls natural.
20. Diffused; strongest in left region.	Loud in left region; remote in right,	Dilatation and hypertrophy of left ventricle; walls not thickened; right ventricle dilated, not thickened.	Dilatation of left ventricle; walls natural; right ventricle dilated; *columnæ carneæ* enlarged.
22. Diffused; stronger than natural, particularly in left region; felt in *epigastrio*.	Diffused, loud; loudest between second and third ribs.	Hypertrophy, and still more dilatation, greatest on left side.	Hypertrophy and dilatation chiefly on left side.
26. Tumultuous; strongest in left region.	Loudest in left region.	Hypertrophy, with dilatation of heart; most of the former in left, of the latter in right side.	Dilatation, with hypertrophy of right ventricle; hypertrophy, with dilatation of left ventricle.
31. Heart presents signs of	Dilatation of the right side.		All the cavities dilated.

Note.—The numbers in the table refer to the numbers of the cases in the works of the authors from which they are taken. Nos. 16, 47, 49, are from Laennec. Nos. 49, 50, 51, from Bertin. Nos. 3, 7, from Forbes. Nos. 1, 2, 7, 9, 16, 18, 20, 22, 26, 31, from Hope.

ventricles were equally, of course, exposed to the influence of the same causes. Besides, it is remarked by Bertin, that in cases of considerable hypertrophy, with induration of the right ventricle, the left ventricle is in general soft and flabby, the two having as it were changed conditions.

The converse of the case just related has been already mentioned in a former part of this paper. In such cases the left ventricle seems to exert a similar influence in changing the direction of the heart, only it is to the opposite side. The bias of the organ, it will be observed, is to its weaker side,—thus in the one case the heart was directed more to the left side of the *thorax*, the left ventricle being in a flabby and diminished condition,—in the other to the right side of the *thorax*, the right side of the organ being the weaker. It is of importance to keep such cases in view; and there is reason to suppose that they occur more frequently than is imagined; and we believe that similar physical signs to those we have recorded in the case above will be found in every instance in which the right ventricle alone is much hypertrophied and dilated, and when it forms the apex of the heart.

The table (pp. 146, 147,) contains all the evidence in the form of facts that we can find in the works of the most eminent, as well as the latest authors on this subject, viz. Laennec, Bertin, Forbes, and Hope. On referring to the works of these authors, we find about eighty cases of disease of the heart,—in almost every case hypertrophy or dilatation,—in which auscultation had been made use of as a means of diagnosis; and it seems a matter of some surprise, that of these eighty, the following eighteen, mentioned in the table, are the only cases which contain any thing like evidence on the point at present under discussion.

In the table, we have stated as shortly as possible in the first column the nature and site of the impulse. In the second column, the nature and site of the sound; in the third column, the diagnosis which accompanies every case; and in the fourth column, the condition of the heart as found on dissection.

It is quite evident from a perusal of the table, that there is a very great want of agreement in the cases therein mentioned, between the signs afforded by auscultation and the actual condition of the heart; and a careful comparison between the first, second, and fourth columns, will show that a correspondence between the signs afforded and the morbid conditions of the heart, according to the rules laid down by Laennec, occurs only in about one-fifth part of the whole; while in a large number the indications are either entirely, or in part, erroneous, incomplete, or altogether absent. And to show how little such indications are to be trusted, even in the hands of the eminent individuals whose works we have consulted, it may be mentioned, that of the eighteen cases, each of which is furnished with a diagnosis, only one-fourth are, as a whole, correct. With these exceptions, almost all the rest are incomplete, and many are very erroneous.

We have thus endeavoured to show the actual state of the evidence on the question at issue; and enough, we trust, has been advanced to induce us to pause a little before coming to join in any conclusion analogous to that so decidedly advanced by Laennec, and apparently so cordially supported by those who have followed in his steps. We do not say that such an opinion is in every case erroneous, but that exceptions to it are very numerous; and, from this fact alone, it will in all probability become of little importance;—misleading the observer who puts his trust in it, should it even be proved true in some cases. It is quite impossible, however, to come to a satisfactory conclusion at present, and we fear it will remain so until a far more extensive mass of evidence on this subject shall have been accumulated.

ART. XII.—*Case of Tumour in the Region of the Liver, with discharge of Biliary Calculi through the parietes of the Abdomen, which terminated favourably.* By WILLIAM MACNISH, M. D. Surgeon, Edinburgh, late Surgeon 63d Regiment.

A LADY, aged about 27, of delicate constitution, the mother of several children, after a residence of between two and three years in the West Indies, during which time she enjoyed tolerable health, when at Barbadoes in 1817, experienced an attack of acute *hepatitis.*

It commenced suddenly with sickness and vomiting, severe pain, tension, and fulness of the region of the liver, the pain greatly increased by pressure, and extending to the right shoulder. There was cough, with *dyspnœa,* and inability to lie on the left side; pulse frequent, with urgent thirst; furred tongue; and hot dry skin. By repeated bleedings, saline purgatives, blisters, and the exhibition of mercury so as to affect the mouth, the active character of the disease was in a short time subdued; but it was two months before the lady could leave her room, and then in a very debilitated state, and unable to walk upright.

Her convalescence proceeded so slowly, and her state was altogether so unsatisfactory, that a return to Europe was deemed essential to her recovery. Circumstances, however, prevented her leaving Barbadoes till May 1818, when she sailed for England.

During the voyage her health improved considerably; but towards its termination, she began to complain of constant uneasiness in the region of the liver, in which there was an evident fulness, and some pain on pressure.

On her arrival in London, early in August, there was a visible tumour below the margin of the ribs, with considerable surrounding tumefaction, and so tender that she could not bear the least pressure of the fingers. Its surface was discoloured in two places, at which it seemed probable the tumour would point. At the end of the mouth, however, there was no perceptible change.

September 15. The tumour had greatly decreased, the pain and tumefaction had subsided, and she could bear to have it freely examined. The discoloration was now confined to one spot, where there was an indistinct feeling of fluctuation. The tumour extended from the margin of the false ribs of the right side to within a couple of inches of the groin, the glands of which were enlarged and painful. Its greatest breadth was little more than two inches, it became narrower as it descended, and at its termination was not more than an inch in breadth. It was irregular and hard; and so thin and superficial, that in grasping it the fingers could almost be made to meet behind it. At its upper part it adhered to the *parietes* of the *abdomen*, the remainder was unattached and moveable. She complained of a sense of fulness or weight, and of occasional lancinating pains in it. Her appetite was weak, and her health considerably impaired.

It was agreed in consultation, that the tumour should be opened at the inflamed spot, and a tent introduced with the view of giving vent to any contained fluid, and of establishing a drain.

September 20. Tumour opened; a small quantity of healthy-looking *pus* followed the lancet, and more was obtained by pressure; but the discharge was altogether inconsiderable, and in a few days was little more than sufficient to moisten the tent, which was daily introduced. So rapid a diminution of the tumour now took place, that, by the 1st of November, it was not half its original size. On the 9th she complained of much pain in the tumour, nausea, headach, and other febrile symptoms, which continued with little abatement till the 15th, when, on withdrawing the tent, I was surprised to find a hard substance in the wound, which proved to be a gall-stone, about the size of a nut. On the following morning another was discharged. A state of comparative ease now succeeded, and continued till the 25th, when there was a recurrence of the pain, followed (on the 29th) by the expulsion of another *calculus* and some fragments. Her health now improved daily; and, though the tumour for some time felt hard and painful on pressure, it was productive of little more discomfort than that occasioned by the daily renewal of the tent.

In March 1819, she was in the fifth month of pregnancy, though the menses had not appeared since she was first taken ill. As utero-gestation advanced, the liver became uneasy, and her general health suffered. On the 20th May, she had a severe and lengthened shivering fit, succeeded by a most distressing hot stage and great debility. Premature labour followed.

A new train of symptoms now supervened. A fortnight after delivery she was seized with violent pain in the epigastric region extending to the back, directly under the *scapulæ*, and stretching down the left side, accompanied for the first time with universal yellowness of the skin. For two days the pain continued severe, and was succeeded on the third by a profuse discharge of a transparent glairy fluid, which, during the three days of its continuance, wetted a great many cloths. Twenty-three large towels were shown me, on most of which, though the fluid itself was perfectly colourless, a tinge of yellow or green remained.

From this period she experienced a succession of similar attacks, at intervals of from four to six weeks, the pain uniformly commencing in the *epigastrium*, extending to the back, and ceasing on the appearance of the discharge, which generally continued about forty-eight hours, but in decreasing quantities till March 1820, when the paroxysms, which had been gradually assuming a milder character, finally ceased. She then went to the country, and took much exercise in the open air. The change was productive of the best results. Her appetite returned, and she gained strength rapidly, and even became stout. She complained at times of uneasiness and sense of weight in the side; but these feelings were of short duration, and productive of little inconvenience. By the end of the year her health was re-established; and, with the exception of occasional slight dyspeptic attacks, has continued tolerably good since.

From the first appearance of the bilious hue to the cessation of the paroxysms, a period of ten months, the skin was more or less yellow, each successive attack being either accompanied or succeeded by a deeper tinge.

In two only of the paroxysms was there any irritability of stomach. The appetite was always defective for some time before an attack, and the bowels were rather slow; but, until the skin became jaundiced, the evacuations, though often unhealthy, generally contained a fair proportion of bile.

The tent, which had been constantly in the side since September 1818, was in August 1821 withdrawn. Within a month after, the wound had completely cicatrized. I have no doubt the tent might have been removed with perfect safety at a much earlier period, but it was continued at the desire of the patient, who firmly believed that the healing of the wound would be followed by unpleasant consequences.

For a little space around the cicatrix, which is nearly two inches below the margin of the ribs, the liver is hard, and adherent to the abdominal *parietes*, and feels uncomfortable on pressure; but no vestige of the pendulous tumour can be discovered.

As to the treatment, it is unnecessary to say much. For the most part, it consisted of mercury in some form or other. Generally small doses of the blue pill, either alone, or when a purgative effect was required, in combination with the extract of colocynth. The nitro-muriatic acid bath was used for some time, seemingly with advantage. For the alleviation of the pain during the periodical attacks, various measures were resorted to, but the most successful were opiates in large doses, fomentations, and stimulating frictions. Light tonics, as the cascarilla or quassia, with the carbonate of soda, and infusion of rhubarb in such doses as to regulate the bowels, were in general use throughout the disease, and were very beneficial.

2, Scotland Street, Edinburgh, November 1, 1833.

Note.—Of Biliary *Calculi* being discharged by suppurative ulceration of the abdominal *parietes*, many examples are now recorded.

In the *Ephemerides Nat. Curios.* by many authors, *passim.*

Tacconi in Commentar. Acad. Bonon. Vol. ii. p. 1. 1732.

Amyand in Phil. Trans. No. 449.

La Peyronie in Mem. de l'Acad. de la Chirurgie, i. p. 185. 1743; and Petit, Œuvres Post. Tome i. p. 320.

Wislicen, Lipsiæ, 1742; apud Haller Dissert. Med. Pract. Tom. iii.

Petit, Œuvres Posthumes, Tome i. p. 323. Two cases exclusive of that of La Peyronie.

Guerin, Mem. de l'Acad. de Chirurgie, Tome iii. p. 470.

Commercium Norimb. 1743, p. 81.

Haller, *Opusc. Patholog. Obs.* 38, *Hist.* 8. 1767.

Hoffman, in Crell. Chemische Annalen, 1789. viii. St. p. 128.

Acrel published in 1788 at Upsal, a Dissertation on Gall-stones escaping by ulceration of the abdominal *parietes;* and Sandorff published in 1801 at Helmstadt, a Dissertation *de Cholelithis ex ulcere abdominis elapsis.*

Vogler, in Museum der Heilkunde, iv. Band, p. 91.

Buttner, Funf besondere Wahrnehmungen, &c.—by an abscess at the navel.

Bruckmann, in Horn's Archiv. 1810, p. 231, 144. Several gall-stones escaping successively by abscess.

Lastly, Mr George White, lately of this city, informed me in May 1825, shortly after I had published the account of a large gall-stone discharged *per anum*, of one which produced first inflammation and suppuration, and then ulceration of the abdominal *parietes*, and was discharged, with recovery of the patient.—D. C.

PART II.

CRITICAL ANALYSIS.

Art. I.—1. *Etudes Anatomiques, Physiologiques et Pathologiques de l'Oeuf Dans l'Espece Humaine, &c.—Investigations, Anatomical, Physiological, and Pathological, on the Ovum of the Human Race, and some of the principal families of the Vertebrated Animals, to furnish materials for the general history of the Embryo and Fœtus, as well as that of Monstrosities or Organic Deviations.* By Gilbert Breschet, M. D., &c. With six Plates. Paris, 1832. 4to. Pp. 144.

2. *Embryologie ou Ovologie Humaine, &c.—Human Embryology or Ovology, containing the Descriptive and Iconographic History of the Human Ovum.* By Alphonso A. L. M. Velpeau, Professor of Anatomy, &c. With fifteen Plates. Paris, 1833. Folio. Pp. 104.

THE mysterious nature of the process of reproduction in the animal world has at all times of the history of science greatly exercised the ingenuity and observation of physiologists; and the difficult and complicated nature of the investigation has necessarily attracted the attention of some of the ablest inquirers. As much of the mystery and obscurity of the process, and the difficulty of explaining several of its phenomena, is naturally connected with the anatomical facts of the new formation at different periods of its progress, it has been always a most essential step in the inquiry to determine the anatomical structure of the different parts of the new formation. From this circumstance it has resulted, that all theories of the process of reproduction framed at periods when anatomy was either little or imperfectly cultivated, and before precision in anatomical inquiry was observed, have been extremely erroneous and fallacious.

In the class of warm-blooded viviparous animals, that is, in the mammiferous animals, or those provided at once with a womb and *mammæ*, the union of the sexes if efficient, gives rise to the formation of a new product, which is destined to be attached for a definite time to the inner surface of the womb, in one form of existence or vital action, and thence to be separated in order to become the seat of a different and new species of vital action. The new product thus formed, or *ovum*, as it is generally denominated, if examined at any given time, is found to consist of certain constituent parts, which may be distinguished into two general divisions;—one, which is the germ or rudiment of the future being, and consequently contains more or less completely the representative form or rudiment of all the parts of that being, and is destined for a comparatively permanent existence;—the other, certain parts which, either as investments of this rudimental being, or as the medium of its attachment to the inner surface of the womb and its nutrition while there, are limited in the duration of their existence to the period at which the newly formed being is detached from the body of its mother.

If the *ovum*, or product of generation, thus defined, be examined in any of the mammiferous animals, it is found that the former assemblage of parts cannot be recognized with the same distinctness and perfection in the early as in the latter period of utero-gestation; and that there is a period, even after prolific sexual intercourse, in which it cannot be demonstrated in any form. It is different, however, with the second assemblage of parts. The existence of these can be perceived at a very recent period after impregnation; and they are believed on very good evidence, if not to commence, at least to precede, the organism of the new body.

The great problem in the solution of the principal difficulties of the process of generation, is to determine the relation of these two orders of organized parts, to discover how much the existence and developement of the one depends on that of the other, to unfold the mechanism of their formation, and to understand the nature of the process by which they are produced. It is manifest that it is impossible to attain the last of these objects, without a thorough knowledge of the anatomical peculiarities of both assemblages of parts; and if, in any situation, the previous knowledge of the structure of organs be necessary to explain their properties and functions, it is in that of the process of reproduction.

There is in this inquiry, however, this peculiar difficulty, that the parts are not at all periods after the process of impregnation exactly the same in appearance and disposition; and it is even uncertain whether they are the same in number. The *ovum* appears to pass through a succession of stages, in each of which it presents different aspects, and acquires new parts, while some formerly distinct, disappear or are blended with others. It has hence resulted that great and serious controversies have existed among anatomists upon the actual existence of several of these parts; and several inquirers have alleged they have discovered others which, indeed, were either confounded or overlooked by their predecessors.

As the product of generation is known to be the same, or similar in the whole class of MAMMALIA, it is necessary, in order to understand its phenomena thoroughly, to study its effects in this class generally, in order to determine, by comparative views, what are the respective functions of each part. As, further, the *ova* of the warm-blooded oviparous animals presents certain parts of the process in earlier stages, and in a shape more susceptible of distinct observation, it has been found expedient to study the phenomena in the *ova* of this class of animals also.

The first inquirers who appear to have investigated the subject with anatomical precision in this manner, were Fabricius ab Aquapendente, and his pupil Harvey. The former, indeed, fell into various errors, some of which were afterwards rectified by Faber and Harvey; and it was not until the latter had investigated the anatomical structure of *ova* in several of the warm-blooded animals, that any accurate facts were established, or a proper method of inquiry was instituted.

The purpose of Harvey, however, was rather to consider the function of generation in a general manner, in reference to the efficient organs concerned in the process, than to trace the process itself and its several stages; and hence we find, that in his writings less direct attention is given to the anatomical disposition of the parts of the human or mammiferous *ovum*, than to the causes by which its developement is effected, and to those circumstances by which the process of generation is modified, disordered, or prevented.

The first inquirers who appear to have been desirous to determine the anatomical characters of the *ovum* are Hoboken, Drelincourt, and Ruysch. The first, in dissertations on the after-birth of the human subject, and of the calf, gave anatomical descriptions of the structure of the *placenta*, and the membranes; the second described the membranes, the *amnion*, and *chorion*; and the third maintained the vascularity of the latter membrane.

Rouhault in 1714, 1715, and 1716, in three dissertations in the Memoirs of the Academy of Sciences, gave descriptions of the *placenta*, in which he maintained generally that this body is the thickened *chorion*, and that its spongy tissue is formed solely by an assemblage of capillary veins from the umbilical vessels, and at the same time denied anastomoses between its vessels and those of the womb. About the same time treatises on the formation of the embryon were published by Pfeiffer in 1719, and Schurig in 1732, in which they chiefly reproduced the ideas and statements of their predecessors. In 1734, Dr Simson of St Andrews undertook to prove that the *placenta* is formed from the *chorion*—a doctrine revived by M. Breschet. In 1753, Sauvages published a treatise on Embryology, in which he introduced some of the more recent views of Ruysch, Littre, and Rouhault; and in 1754, Albinus represented the *placenta* to be formed of blood-vessels, of cellular tissue, and of membranous investments derived from the *chorion*.—(Annot. Acad.)

The researches of Noortwyk in 1743, and those of Roederer in 1750 and 1758, contributed to render the knowledge of the *ovum* in the human subject and mammiferous quadrupeds more perfectly known and better understood; and Haller, by personal observation, and exact comparison of the facts ascertained by his predecessors and contemporaries, gave a view of the whole, more complete and satisfactory than had been yet exhibited. He distinguishes the investments of the *fœtus* into four,—the *membrana ovi exterior*, corresponding to the *decidua vera* of Hunter; the *chorion*, corresponding to the *decidua reflexa* of Hunter; the *membrana media*, corresponding to the *chorion* of Albinus,—the *allantois* of Needham, Diemerbroeck, Bidloo, Harder, and Hoboken, and the *chorion* of Hunter; and lastly, the *amnios*, containing the fluid, abundant or scanty, in which the *fœtus* floats.

But even after all the research and collation of this indefatigable inquirer, the subject remained involved in a very great degree of uncertainty and obscurity,—when William Hunter, by his researches on the human gravid *uterus*, was believed to have entirely ascertained all the anatomical facts, and to have dispelled every sort of doubt. It is sufficient to say, that Hunter was the first who gave just views of the *decidua*, or most external membrane of the *ovum*,—the *membrana exterior ovi* of Haller,—and showed that it consisted, at least at one period of utero-gestation, of two folds,—that he represented the *chorion* to form the third membrane of the *ovum* from the second to the fifth month, and the second membrane betwixt the latter period and the date of the termination of uterine life,—and that he distinguished the *placenta* into two parts—a uterine or maternal, and a fœtal, which, according to his researches, did not communicate with each other.

The high reputation of Hunter as an anatomist procured for his representations almost universal credit and implicit deference; and for forty or forty-five years, at least, not only were his nomenclature and distinctions very generally taught in the schools of Great Britain and the continent, but no anatomist, physiologist, or accoucheur evinced sufficient independence or originality to question their accuracy, or depart from the views of that anatomist.

Several points, nevertheless, had been left in a state of uncertainty; and of others imperfect, or perhaps erroneous, views had been given. The nature and use of the *vesicula umbilicalis*, and of the omphalo-mesenteric vessels had been either altogether overlooked, or placed in an erroneous and false point of view.

Though the *vesicula umbilicalis*, which, according to Lobstein and some others, represents the *allantois* of quadrupeds, had been seen by Diemerbroeck, Albinus, and Boehmer,—Haller, by stating that in the bodies of eight pregnant females whom he had inspected carefully, he could recognize no *vesicula* in which the *urachus* terminated, threw so much doubt on its existence, that it was long regarded as apocryphal, or the result of erroneous observation. This circumstance led Wrisberg, Soemmering, Sandifort, Blumenbach, and more recently Lobstein, to investigate more completely the nature of these bodies. From the observations of the latter author, it results that the *vesicula umbilicalis* is a real existence, but that its presence is confined to a particular period of the life of the embryon. Situate beneath the *amnios*, between that and the *chorion*, sometimes towards the insertion of the chord into the *placenta*, sometimes more or less distant from the insertion of the latter, it is spherical, spheroidal, or pyriform, elevating the *amnios*, and projecting through it,—has thin walls, sometimes transparent, more frequently opaque, and contains a fluid of unknown characters, but which possesses some consistency, and is generally of a yellowish hue.

The *vesicula umbilicalis* does not belong to the entire period of uterine life. Some time after conception must elapse before it appears; and Soemmering did not observe it in the case of two *ova* between the third and fourth weeks after impregnation. The exact period at which it is said first to appear was not ascertained by Lobstein, although Autenreith saw one upon an *ovum* upon the forty-first day after conception; and if this is to be regarded as the earliest period at which it appears, it would give a space of very nearly five weeks. But at whatever time the *vesicula umbilicalis* appears, it augments until it acquires the size of a large pea; and after this it begins to diminish, and it disappears completely about the middle of the period of utero-gestation.

The largest known *vesicula umbilicalis* is that mentioned by Lobstein to be about six lines in diameter. It is rarely found after the fourth month, although Hunter states that it is sometimes preserved to the termination of pregnancy; and at this period, instead of being larger proportionally, it retains the same size, as in an *ovum* of between two and three months. We now see the reason why Haller could not, in the eight female subjects which he dissected, recognize this body; since it is manifest that if they were at any time beyond the fifth month, it was not to be expected that the *vesicula umbilicalis* was to be found.

The omphalo-mesenteric vessels have been the subject of not less doubt than the *vesicula umbilicalis*. Though imperfectly understood by previous authors, they seem to have been first described by Haller with some degree of accuracy. They consist of an artery and a vein, the first proceeding from the inferior mesenteric to the *umbilicus*, between the intestinal convolutions, passing through this aperture to the *fœtus*, to the chord, and *placenta*, and proceeding between the *chorion* and *amnion* to the *vesicula umbilicalis*, to the walls of which it is finally distributed; the second, arising from the *vesicula umbilicalis* by numerous very minute roots, and accompanying the artery backwards, until it reaches the navel, where it is separated from the artery by intestinal convolutions, and finally terminates in the superior mesenteric vein before that vessel enters the *vena portæ*.

We shall at present say nothing of the supposed purposes of this arrangement; for this is one of the grand points of inquiry which renders it necessary to study the anatomical peculiarities of the human and mammiferous *ovum*, at different intervals from the period of conception. It is merely requisite to observe that the omphalo-mesenteric vessels exist, like their associated organ the *vesicula umbilicalis*, only at a particular period of the process of utero-gestation. How early they appear was not well determined in the time of Lobstein. It is, however, well known that they are no longer visible in the course of the fourth month.

It is evident, from the foregoing details, that, upon the early history of the anatomical structure of the *ovum* of mammiferous animals, information was either limited and imperfect, vague and uncertain, unsatisfactory, or absolutely erroneous; and no one who is familiar with the statements usually made by authors, anatomical, physiological, or obstetrical, upon this point, will deny, that in too many instances they either satisfied themselves with copying slavishly from each other, and repeating the usual unfounded and fanciful statements, or discarded entirely the subject as one at once of extreme obscurity and difficulty, or of no practical importance,—the usual stale and unprofitable argument by which indolent persons satisfy themselves with neglecting all inquiry which does not promise immediately applicable results. These observations, though not absolutely necessary to demonstrate the necessity of the inquiries which form the subject of the two essays before us, may nevertheless serve to communicate some idea of the nature of the inquiry to be undertaken, and how much was to be expected in order to determine the points at issue.

It appears that the circumstances now mentioned, at all events, had, many years ago, impressed not only the present authors, but Moreau, Roux, Dutrochet, and Beclard in France, and Meckel, Oken, Huschke, and Burdach in Germany, with the idea that the whole subject ought to be subjected to new inquiry, with all the means of precise observation.

The researches of M. Dutrochet, as connected with those of the present authors, deserve some notice. This physiologist, who had been engaged for several years in the assiduous study of the products of generation, published in 1814, in the Memoirs of the Medical Society of Emulation, (Tom. viii.) the result of his researches, in which he felt himself not only called upon to give views somewhat new of the different envelopes of the *fœtus*, but to give a new classification, and to alter entirely the nomenclature previously used.

The views of M. Dutrochet, from having been published at two separate times, are rather confused and contradictory. Thus he describes under the name of *chorion* and external and internal *epidermis*, what is evidently the uterine *decidua* of other anatomists. The middle membrane, which he states he had found beneath the *chorion*, is in truth the *decidua reflexa*; and he applies the name of *amnios* to the real *chorion*. These distinctions were the effects of imperfect observation and premature generalization; and he afterwards attempted to rectify the mistakes thus committed by applying to the external or uterine *decidua* the name of *exochorion*, and to the internal, or *decidua reflexa*, that of *endochorion*. In short, however uncharitable it may seem, we must be allowed to say that these distinctions of M. Dutrochet would lead to the inevitable conclusion, that he had not only derived his description from an insufficient number of instances, but that he had formed it in forgetfulness or disregard of the facts established by previous observers. It is very remarkable, but not less necessary, to observe, that M. Breschet, though originally associated with M. Dutrochet in this inquiry, and adopting many of his opinions, has nevertheless virtually applied to his researches the same character which we have now given them. It appears that, in the early stage of this investigation, M. Breschet either assented to or adopted many of the views of M. Dutrochet; and, as M. Velpeau was convinced, from a variety of the results of his own personal inquiries, that these views were erroneous, he felt that he could not identify the researches in which he was already engaged, with those either of the one or of the other author, and resolved to conduct them and publish their results independently.

It is remarkable, nevertheless, that, while M. Velpeau represents M. Breschet as holding the opinions of M. Dutrochet, M. Dutrochet believes that M. Breschet has adopted many of the opinions of M. Velpeau; and, indeed, in 1826, he accused M. Breschet of renouncing the common opinions of these gentlemen, in order to embrace those of M. Velpeau. We believe that the views of M. Dutrochet were published in a manner too precipitate, and in a shape too imperfect, to be altogether well founded; and that, if M. Breschet saw good reason to change his opinion, it must have been very wrong not to do so. But it is manifest, from the present essay, that M. Breschet is very anxious to establish his claim to an independence of views on those of both gentlemen; and, while he differs from those of M. Dutróchet, he represents M. Velpeau as adopting the views entertained by himself. These representations of M. Breschet have obliged M. Velpeau to make explanations, of which the following sketch will give some idea.

We learn from the introduction of the work of M. Velpeau, that he had begun in the year 1821, when assistant-anatomist at the museum of the faculty, to study the subject of the structure of the *ovum*, and to remark its chief peculiarities at early periods in the process of gestation. In consequence of being brought into frequent intercourse with M. Breschet, then chief of Anatomical Studies, he communicated to this gentleman his intentions; and M. Breschet, who appears at that time to have been engaged in similar researches, made to M. Velpeau a proposal not uncommon between established men and scientific aspirants. This was, that M. Velpeau should bring his preparations to the museum of M. Breschet, where the painter employed by that teacher was to delineate them;—that M. Breschet should in his turn lend M. Velpeau such preparations as he possessed;—and that, when he had obtained his wishes with them, he should leave both to M. Breschet, who was subsequently to employ them in the construction of a general history of the *embryon*. To this arrangement M. Velpeau acceded; and after the completion of twelve of the delineations found in the present work, the half of the expence of which M. Breschet had already defrayed, he proposed also to join his name to the publication of the researches of M. Velpeau.

Of this proposal the latter author, then young in science, would have willingly availed himself. But as M. Breschet had not only been little conversant with the particular bent of the researches of M. Velpeau, and also their results, but appeared to be still under the influence of the doctrines of M. Dutrochet, and did not form a very clear idea of the principles which M. Velpeau was desirous to impress, the latter conceived that he could not with propriety avail himself of his complaisance. M. Velpeau, therefore, read to him only the two memoirs, which he presented in the spring of 1824 to the Academy of Medicine.

From a passage of the memoir of M. Breschet, nevertheless, the reader is given to understand, that, though the opinions of the two authors differ, this difference is not very material; and further, that M. Velpeau, though originally differing in opinion rather widely from M. Breschet, has at length adopted his views. Against this representation M. Velpeau reclaims, and imputes to M. Breschet the character of entertaining the same views with M. Dutrochet.

Of the two treatises before us, the work of M. Velpeau must be allowed to be, upon the whole, the most complete. It is, we think, more systematic and methodical in the exposition of the subject, and it also takes a fuller and more extensive view of its different divisions. But, without entering into any minute examination of the comparative merits of the two treatises, we shall take a general survey of the facts ascertained, and the views exhibited by both authors, and endeavour in this manner to communicate an idea of the present state of knowledge on the subject of human embryology. In this survey, we shall follow chiefly the arrangement observed by M. Velpeau.

After the character given at the commencement of this article of the constituent parts of the human *ovum*, it is almost superfluous to say, that the investments or envelopes of the *fœtus*, or what are denominated here its appendages, are the membranes, the *vesiculæ*, the *placenta*, and the chord.

Of the membranes, the outer, viz. the *decidua* or *caduca*, the *epichorion* of Chaussier, the *epione* of Dutrochet, and the *perione* of Breschet, is the first that claims attention; and if it was requisite to prove how much confusion of description and conception has prevailed on this subject, the reader would only have to glance at some ten or twelve of the pages of the long and complicated chapter on this subject by M. Breschet. After a view of all the opinions entertained by different authors, including Sandifort, Hunter, Home, Siebold, Osiander, Moreau, Rosenmuller, Joerg, Chaussier, Bojanus, Oken, Carus, Dutrochet, Velpeau, Meckel, Burdach, and Baer, he leaves us almost as much in the dark at the close as at the commencement.

We are informed, however, in the second chapter, that the generative organs of the female, when impregnated, assume a state analogous to that of inflammation;—that the effect of this state is, like that of inflammation, to give rise to a new product; that, in short, the inner surface of the *uterus*, stimulated by the venereal act, is excited to the formation of a secretion of plastic fluid, analogous to that which constitutes the false membranes; and that this coagulable fluid forms a layer covering the whole internal surface of the *uterus* with an unequal flocculent substance, applied and united to the mucous uterine membrane by numerous minute filaments, and with its internal surface smooth and uniformly polished, yet perforated by numerous pores, which are the apertures of minute canals penetrating the substance of the membrane obliquely, yet without passing to its opposite surface. These apertures, which are seen on the internal surface only, are not all of the same diameter. Most of them would scarcely admit a hair or a hog's bristle, and the largest very little exceed this size; whereas in recent deciduous membranes, before immersion in spirit, these orifices are more open. This internal surface is so very smooth, that one might be led to imagine that it was covered by a serous membrane; but repeated careful dissection, according to M. Breschet, has never been able to demonstrate the presence of any membrane of this description. Though less consistent than that of all the organic membranous tissues, it is more so than that of the false membranes. Its thickness is from two to three lines, but varies according to the period of gestation, and the point of the membrane observed; thus it is thicker towards the angles of the uterine cavity, and especially its inferior angle, than at the *fundus*, the circumference of the middle, corresponding to the body of the *uterus*.

The cavity of this species of cyst is filled by a liquid denominated by M. Breschet the *Hydroperione*, the existence of which demonstrates the absence of any opening in the *decidua*.

The account now given, M. Breschet represents to belong to the *decidua* or *perione*, before the arrival of the *ovum* in the *uterus*,—a contradiction which we cannot easily reconcile with his original statement of the production of this membrane by inflammation of the inner surface of the *uterus*, unless we suppose, that, during the transit of the *ovulum* from the peritoneal to the uterine extremity of the Fallopian tubes, an irritative process is at the same time proceeding in the inner surface of the womb.

M. Breschet then proceeds to give of the descent of the *ovum*, and of its effect upon the *decidua*, a view which differs not very considerably from that of William Hunter. He, in the first place, asserts, that the *ovum* is too small to push before it the primitive *perione*, and to form by this propulsion the *decidua reflexa*; and in favour of this idea, he adduces the fact, that he has found *ovula* of the size of a grape seed, or of a vetch, in the very substance of the *decidua*. He, on the contrary, maintains, that the arrival of the *ovulum* at the uterine extremity of the tube and its continuance there, produce a more copious secretion of plastic matter upon this point; and as it previously was surrounded with a plastic substance, it is then imbedded in the thickness of the *decidua*, which he represents to undergo a local hypertrophy; and as it increases in size, it thrusts the primitive *decidua* upon itself, without causing it to quit the inner surface of the womb at any point. This detachment and agglutination, he farther conceives, can only take place, if the *ovulum* be voluminous at the point of contact with the *perione*, and if the propulsion mentioned by physiologists take place instantaneously. By this mechanism, he contends that the *ovulum* converts the primitive *decidua* into two distinct but continuous investments, nearly in the following manner.

While the *ovulum* is placed in the substance of the primitive *decidua*, without being in its proper cavity, the surface of the *chorion* is covered by a well-marked, shaggy, or hairy investment of filaments, which everywhere penetrate the plastic substance of the reflected *perione*, and fixes the *ovulum* in its position; and which, as the *ovulum* on its arrival in the womb presents no *tomentum*, are a powerful agent of absorption, nutrition, and developement. As these villosities are not confined to one point, but are uniformly distributed over the whole surface of the chorion, and as their existence is temporary, M. Breschet infers that they are the rudiments of the *placenta*.

As the *ovulum* under the influence of vital action enlarges, the *decidua* and the *uterus* also enlarge, the former by the actual increase of new plastic matter; and in this manner the *ovulum*, originally small, and imbedded in the *decidua*, becomes, as it enlarges, covered entirely by *decidua*, not by detaching, as Hunter represented, any of that membrane from the inner surface of the womb, but by the simultaneous accretion of new substance. It is thus that we find, when the *ovum* is contained in the *uterus*, two deciduous membranes, one external, the uterine *decidua* or primitive *perione*, the other internal, the *decidua reflexa*, or the fœtal *perione*. In short, between the date of fecundation and the arrival of the *ovulum* in the *uterus*, there is only one *decidua*, the primitive or uterine perione, forming a shut sac; but when the *ovulum* has passed from the Fallopian tube into the womb, it is invested in the plastic matter of this membrane, which is then augmented in proportion to the growth of the *ovulum*, and is gradually expanded into a second *decidua*.

M. Breschet also maintains, that there is no perforation of the membrane by the *ovulum*, as many physiologists have thought and taught. Even at the apertures of the Fallopian tubes and the *cervix uteri*, no perforation is cognizable, and the membrane is every where shut. Its external surface is applied, and adheres to, the inner surface of the womb by means of the vascular *villi*, or filaments of its mucous membrane, feebly at first, but firmly in proportion as gestation is advanced. At the *cervix* alone, it is not in immediate contact, being separated by a quantity of dense ropy mucus, which plugs the *cervix* to the vaginal outlet. The prolongations of this membrane into the Fallopian tubes, and which have been compared to the *chalazæ* of the eggs of birds, belong to the external surface of the uterine *decidua*, situate in the two sides of the larger extremity of the ovoid figure which it presents.

M. Breschet further maintains the existence between the two divisions of the *decidua* of a cavity or space containing sero-albuminous fluid, which he denominates *hydroperione*; and he represents this cavity to vary, according to the period of gestation, being large at first, and smaller afterwards, in consequence of the two membranes always approximating, but never uniting, —unless at one point to be immediately mentioned.

From these views, which M. Breschet contends are founded on personal observation, he infers that the opinion of Chaussier, that when the *ovulum* arrives in the womb, the *epichorion* is yet merely a pulpy matter, in which it sinks, and is enveloped, and of which it afterwards forms two membranous folds, is quite inadmissible. The smooth uniform appearance of the inner surface of the *perione*, where the *hydroperione* is contained, and the numerous minute pores which that surface presents, he argues, could not be formed in the manner represented by Chaussier; since, if the uterine cavity contained only a substance semifluid previous to the reception of the *ovulum*, that substance could not be formed into two distinct folds, and these smooth membranes, which would at first be distant, and afterwards contiguous to each other, ought to form only a single layer between the *ovum* and the womb during all the periods of pregnancy.

These views do not, so far as we have hitherto proceeded, differ very materially from those given by M. Velpeau, who admits the same specific irritation of the uterine mucous membrane causing the secretion or exhalation and deposition of coagulable matter, which is speedily formed into a sort of cyst or bladder filled with transparent or slightly rose-coloured fluid, applied to the whole extent of the uterine cavity, and continued occasionally into the beginning of the Fallopian tubes, and the upper part of the *cervix*, in the form, however, of solid chords, yet without perforation or aperture.

He denies, however, any resemblance to the process of inflammation; and maintains that most physiologists, such as Hunter, Wrisberg, and Blumenbach, have fallen into serious mistakes by adopting this view. He maintains that the matter effused presents none of the characters either of coagulable lymph or the inflammatory crust, and that, instead of presenting a white, yellowish, or gray colour, great tenacity, compactness, and extensibility, it is reddish, easily lacerable, yet very extensible. It appears, he adds, to consist of gelatine, mucus, and colouring matter, and is always ready to be converted into a homogeneous fragile pulp. It differs also, he adds, from the product of inflammation, by evincing little disposition to contract adhesions; by being as easily detached from the uterine surface, in the course, and at the close of utero-gestation, as at the commencement of that process; and by exhibiting no obvious traces of organization. M. Velpeau, in short, regards the *decidua* as the product of an excretion of the uterine cavity, inorganic, and without marks of proper tissue, and hence he applies to it the name of anhiste, ἀνιστος, *α. priv.* ιστος, or, in other words, the tissueless membrane; and he disapproves equally of the term, *Epichorion* given by Chaussier; *Epione* given by Dutrochet; *Perione* given by Breschet; and the *Neselhaut* or *Nidamentum* of Burdach.

We should have preferred, if, in distinguishing this substance, M. Velpeau had said the product of a *secretion*, not an *excretion*,—a term which, in fact, is used in correct physiological language to signify the material product of secretion.

It appears, therefore, that though MM. Breschet and Velpeau agree in regarding the action that produces the *decidua*, as an exaltation of the vital action in the *vector* canal, according to Blainville, that is to say, the *Utero-Fallopian* tube, yet they differ in the degree of this action,—M. Breschet allowing it to be analogous to inflammation, and M. Velpeau maintaining that it is totally different from this. In his farther description of the process, M. Velpeau differs still more materially from M. Breschet.

The *ovulum*, according to the former author, upon reaching the uterine extremity of the tubes, does not sink into the soft matter of the *decidua*, as represented by Breschet, but depressing this membrane, and gliding between it and the womb, is forthwith attached to the inner surface of this organ, so that one part of the *ovulum* is fixed, and the other free, which then thrusts before it the contiguous part of the *decidua*, and partly stretching it, partly causing an increase in its growth converts this portion into the *decidua reflexa* vel *interna*, or the *ovuline decidua* of Dr Lee and Mr Owen, and to which M. Velpeau prefers to apply the name given by Chaussier of *epichorion*. The question of the formation of the *placenta* is the great point upon which these physiologists are divided.

The developement of this organ, according to the observations of M. Breschet, takes place in the following manner. M. Breschet, in the first place, maintains two facts, the accuracy of which must depend on anatomical investigation. The first is, that the uterine surface is in no part uncovered by *decidua*, and that at the part to which the *placenta* is attached, both the uterine and the reflected *decidua* are interposed between the uterine mucous surface and the *placenta*, though in a very attenuated and compressed form; and that, in short, it is entirely inaccurate to assert that the *decidua* is wanting at that part of the womb to which the *placenta* is attached. He only admits that, as the pressure upon this point is greater than any where else, not only do the two folds appear more intimately united, and more difficult to separate, but they seem to present considerable thickness.

The second fact which M. Breschet conceives to be established, is, that the *chorion*, or immediate investment of the *ovulum*, presents a remarkable villosity of investment of minute vessels during the earlier states of utero-gestation; that these strike immediately into the reflected or *ovuline decidua*, and form in this manner the bond of attachment between the *ovulum* and that membrane; and, as the growth of the *ovulum* advances, these flocculent villosities diminish over the general surface, and, becoming restricted to a particular point, press the *decidua reflexa* to the uterine *decidua*, and in this manner give rise to the formation of the *placenta*. It thus appears, according to the observations of M. Breschet, that the villous filamentous vascular covering denominated the *chorion* constitutes the rudiment of the *placenta*,—that the former membrane disappears as the latter begins to be formed,—and that, in short, the *placenta* is generated at the expence of the *chorion*.

The views of M. Velpeau are slightly different. Setting out with the principle, that there is no more communication between the *placenta* and the womb in the human female than there is between the *chorion* and *amnion*, he further maintains, that the spongy, that is, the uterine, substance of the *placenta* is covered by a thin membranous fold, the nature of which, he believes, has been hitherto imperfectly understood. In the early part of utero-gestation, while the *placenta* has not yet formed a compact mass, he maintains that there is no trace of the membranous fold now mentioned; but that, as soon as the tomentose or filamentous clusters of the *chorion* are agglomerated into a mass, it begins to appear as if covering their *apex*, and it is speedily observed to become continuous, and eventually to be confounded, with the circle at which the double fold of the anhistal membrane or *decidua* is united. It nevertheless contains no vessels; and the idea of a circular venous sinus, maintained by some anatomists to exist at the outline of the *placenta*, is represented by M. Velpeau to be the result of inaccurate observation. This *utero-placental* fold, he further informs us, presents the disposition of the arachnoid membrane of the brain, that is, that it adheres intimately to the *placenta* on the surface of the lobules of that body, but that in the interlobular fissures it may be detached under the form of a thin transparent film.

A layer of matter a great deal thicker, more fragile, and less uniform than the one now mentioned, is observed in the meantime to enclose all the vascular trunks, and this has given rise to the belief, that the vessels of the *placenta* are ramified in the substance of the *decidua*,—that the *chorion* consists of several folds,—that the anhistal or deciduous membrane furnished one fold to the external, and another to the fœtal, surface of the *placenta*,—and that the thin film of the latter was continued between all the fibrils of its lobes and lobules. Its component *lamellæ*, M. Velpeau regards as the result of a peculiar exudation from the womb, from the *chorion*, and from the tomentose bundles of the latter, the agency of which in their formation he is obliged to admit, from the circumstance that they are recognized only a long time after the arrival of the *ovulum* in the *uterus*, whereas the anhistal bladder is formed immediately after fecundation.

We should have been glad to have observed that M. Velpeau had paid a little more regard to consistency in this statement; for, immediately after, he observes, that the uterine exudation which gives rise to the *decidua* appears to him to be equally produced by the external surface of the *ovulum* and its villosities, and the internal surface of the Fallopian tube, from the phenomena of extra-uterine pregnancies, and that the anhistal layer surrounding the product of conception does not proceed from any mucous membrane. Now this assertion must either imply that the uterine *decidua* is the result of a secretion from the uterus, and that the *ovuline decidua* is the result of a secretion from the *ovum* and Fallopian tubes, or that the inner Fallopian and uterine surfaces are void of the characters of mucous membrane.

Previous to entering on this subject, however, it is requisite to advert to the formation and characters of the *chorion* given by M. Velpeau. This membrane, inspected in three *ovula* of from ten to twelve days, presented the appearance of a velvety hydatid, or a minute transparent vesicular bladder, with the external surface free but fungous, and, as it were, rough, and its interior filled by a transparent fluid, in which it was impossible to recognize either *amnios*, *vesicula*, or embryon. In *ovula* of three or four weeks the *chorion* is not smooth on both sides, as has been stated by many respectable authors, among others Lobstein,—nor opaque, villous, and tomentose, as represented by Beclard and Meckel,—nor unprovided with villosities till the course of the third month. At fifteen days, on the coutrary, at three weeks, at one month, as well as at two, M. Velpeau has found the external surface of the *chorion* invariably covered with the same downy coat, its inner surface smooth and regular, and its substance rather not less transparent than at any other period of gestation. The causes of fallacy in this head are irregular *vesiculæ*, or the detachment of the *amnios*.

In opposition to the general opinion, M. Velpeau maintains that the villosities of the *chorion* are not vascular, because he finds that their filaments exist previously to the appearance of the blood-vessels of the umbilical chord;—because they are distributed over the whole surface of the *chorion*, whereas the umbilical vessels and *placenta* are restricted to one region;—because they do not ramify. like blood-vessels, but are merely parallel filaments; because, notwithstanding numerous efforts of anatomists, no one has demonstrated that its constituent filaments are hollow; and, lastly, because, when submitted to microscopical inspection, they appear to be simple areolar sponges, and, though they perform the part of suckers or absorbents of nutritious fluids, they are totally void of permeable canals. (p. 14.) For the accuracy of this inference, M. Velpeau refers not only to his own authority, but those of M. Blainville, Carus, Breschet, and Raspail.

If, indeed, continues M. Velpeau, a fecundated vesicle be attentively inspected when merely visible, and when the embryon is not yet apparent, its surface is already covered by *tomentum*, or a downy coat, the filaments of which are short, solid, and void of ramification, till the fourth or fifth week, and most of them terminating in loose but knotted ends, like little ganglions. At first sight the *chorion* appears as if covered with delicate granulations. Subsequently, these small filaments are lengthened to four, five, or six lines; their knotted ends increase in number; and they then appear as if interrupted by two, three, or four minute grains. A little after this, and in the regular course of events, the granulations seem to disappear by reason of the elongation of their sustaining filaments, although they may be observed even at the period of delivery. It is not to be forgotten that the granulations now mentioned may, by degeneration, give rise to the clusters of hydatids, and the vesicular or hydatoid mole occasionally met with in the womb.

M. Velpeau differs from M. Breschet in representing the *ovulum* as passing between the *decidua* and the womb, and the chorion consequently to become attached by one-half to the uterine surface, while the other is sunk in the soft matter of the *decidua*.

In the former direction, as the villosities and granulations are applied to a living organized body, habitually distended by fluids, they become the seat of an active process of nutrition and rapid developement; in the course of which, vessels, expanded from those of the umbilical chord, yet never proceeding to the extremity of the component filaments of the down, are speedily formed, and become the rudiments of the *placenta*. In the other direction, those villosities which strike into the *decidua*, —an inorganic pulp,—cease from that instant to live and grow; or, if they are elongated, it is a mere mechanical process, in consequence of the enlargement of the *ovum*, and they indeed diminish in number and size as that body increases.

It hence results, according to the observations of M. Velpeau, that the external surface of the *chorion* is not the same at all stages of the process of utero-gestation; that, at first, between the second week and the fifth or sixth, its whole surface is covered by villosities; but that, afterwards, when one side, viz. that *towards* the womb, has firmly fixed itself to that organ, it becomes vascular and opaque, while the opposite, or that *from* the womb, becomes smoother and less shaggy, in consequence of the villosities either dying or ceasing to enlarge at the same rate and proportion as the *ovum* itself, and at the same time is comparatively transparent.

The opacity of the *chorion*, however, at the uterine side of the *ovulum*, depends not on the *chorion* itself, but chiefly on the granulations, villosities, and blood-vessels issuing from the *ovum* at this point. M. Velpeau states positively, that, after examining the *chorion* in more than 400 *ovula*, either at the full time, or at other periods of gestation, he has been in all cases satisfied that it is equally thin and transparent at the *placental* side as at the *decidual*, and that this may be demonstrated by mere maceration.

M. Velpeau further maintains, in opposition to Chevreul and Dutrochet, that the *chorion* in the *ovum* of the human female is always a simple, not twofold, membrane.

On the origin of this membrane we do not find any very positive facts. M. Velpeau is disposed to think that the old opinion maintained by Hippocrates, Harvey, and Burton, and revived by Mondini, Mojon, Roux, Chevreul, and Blainville,—that the *chorion* is continuous with the integuments of the fœtus,—is confirmed by the results of his own observations. In the subsequent periods of utero-gestation, at all events, it is blended so closely upon the chord, with the *amnios*, and especially with the umbilical ring, that it becomes impossible to deny positively its continuity with the integuments, but that it is probable that it is connected with the cellular tissue of the umbilical chord. Subsequently, when treating of the disposition and developement of the *amnios*, he infers from several examples of *ovula*, at different periods after fecundation,—that the hypothesis which represents the *amnios* and fœtal *epidermis* as continuous after the first month of embryal life (p. 27) is the most probable; that, during the first fifteen days of embryal life, the *amnios* has immediate connections only with the embryal portion of the umbilical chord, upon which it is afterwards folded so as to place it in contact with the internal surface of the *chorion*; that this arrangement is, with few exceptions, continued until the abdominal *parietes* are completely developed; that then it is difficult to question a continuity which previously cannot be recognized (p. 28;) and that then the *chorion* may be said to be continuous with the *epidermis*.

To proceed, however, with the application of this to the formation of the *placenta*, we observe, that M. Velpeau represents the *placenta* to derive its fundamental aliment not directly from the villous *tomentum* of the *chorion*, but from the expansion or ramification of the vessels of the umbilical chord, and to be developed along with these only about the third month after conception. Before this period, he remarks, the *tomentum* of the *chorion* is void of vessels, and can be compared hitherto only to the flocculent covering of the root of plants. After this period, vascular canals form in it as in new tissues, at first a great deal more delicate than the filaments in which they are seated, yet susceptible of injection at the third or fourth month by coloured alcohol, size, or oil of turpentine, and gradually elongating and becoming more capacious. The original filaments, however, remain solid, and do not apparently increase in size.

When the *ovulum* has insinuated itself between the internal surface of the womb and the *decidua*, the tomentose vesicle, after becoming attached to the *uterus*, remains applied to it by one-half, while the other is sunk in the anhistal membrane. The attached half, therefore, as the formation of vessels already mentioned takes place, begins to adhere more firmly to the internal surface of the *uterus* by these vessels, which are increasing every day and hour in size, strength, and number; while the unattached half, at which the *ovum* continues to enlarge, is simply applied to the anhistal membrane,—its tomentose filaments gradually disappearing. In this manner, therefore, the attached half, which becomes vascular by the extension or prolongation of the vessels of the umbilical chord, necessarily gives rise to the formation of the vascular mass which eventually constitutes the *placenta*.

We conceive that, in this representation of the developement of the *placenta*, M. Velpeau is perfectly correct in representing that event to commence the moment the *ovulum* enters the *ute-*

rus, and not, as some authors have stated, three or four months after gestation; and consequently, that the dimensions of that organ keep pace with those of the *ovulum* itself.

This conclusion is in some sense supported by the fact of the different points of the womb to which the *placenta* is found to be attached.

He rejects equally the idea, that the *placenta* and *ovum* are attached to the most vascular part of the womb, and are influenced by specific gravity; the former on the ground that the villosities of the *chorion* can possess no discriminative knowledge of the most vascular part of that organ; and the latter, because, as the animated *ovulum* quits the tube at the end of about eight days, it is manifest that the position of the woman must be quite indifferent in the determination of this event; and, whatever be the time occupied in the transit of the *ovulum* into the womb, it is manifest that the female is more frequently in the erect than in any other position, and hence the attachment to the neck, instead of being the most rare, ought to be the most frequent.

To explain the circumstance of the particular spot to which the *ovulum* is attached, in a manner more natural, M. Velpeau observes, that the *ovulum* at its entrance into the womb meets the tissueless bladder, or *decidua*, and can proceed no farther without detaching it from the womb. If the attachment, therefore, is everywhere uniform, the *ovulum* pursues its original direction, glides along the *fundus* of the womb, which, by means of the *decidua*, appears to continue the canal from one tube to that of the opposite side, or, indeed, it stops at the outlet of the tube, and then is attached to one angle of the womb. If, on the other hand, the adhesion is firmer at one point than at another, the *ovulum* may descend to the *cervix*, or to some other point where the adhesion is least firm. In proof of the justice of this hypothesis of the reason of the *placenta* being attached to one point more than another, M. Velpeau states, that, of thirty-four females dead during pregnancy, or soon after delivery, at the hospital of Perfection, necroscopic inspection showed that the centre of the *placenta* must have corresponded twenty times to the orifice, of the Fallopian tube we presume, three times before, twice behind, three times beneath one of the tubes, and only six times to the *fundus uteri*.

We should have thought that the arguments now adduced were more conclusive as to the point at issue, if the author had previously demonstrated the fact, that the *ovulum* possesses the powers here attributed to it. M. Velpeau assumes that the *ovulum* has received some impulse which carries it through the Fallopian tube, and perchance to the opposite side of the womb, and that, as if it were possessed of volition, it has some preference for this direction. Of this fancy we can perceive in the movement of the *ovulum* no proof. We admit, however, that the circumstance of the *placenta* being attached at points corresponding to the orifice of the tube in twenty of thirty-four cases, does tend to prove a greater frequency of attachment at this than at any other point.

On the obscure point of the *mode of union between the womb and placenta*, it is not less difficult to establish certain facts; and we find that M. Velpeau has, with some knowledge of the labours of his predecessors and contemporaries, made great efforts to arrive at positive results. We should have wished that his statements had been more precise, which would have saved us some little trouble on the present occasion. "It is well known," he says, "that Noortwyk, Astruc, Mery, Haller, and Baudelocque believed in the direct continuation or transition of the large venous canals of the womb into those of the *placenta*." Now this is altogether erroneous; for, whatever was the opinion of such persons as Astruc and Baudelocque, it is certain that Haller never believed in the direct transition of the vessels, whether arterial or venous, of the *uterus* into those of the *placenta*. He expressly states on this subject;—"His sinubus," *i. e.* of the womb, "credas arterias uteri serpentinas se immittere, quæ sub posteriora tempora graviditatis de facie uteri interna erumpunt, qua *placenta* adhæret. Nemo tamen hactenus eas arterias in his sinubus vidit, easve de placentæ cavernulis eduxit, etsi quidem Ill. Albinus placentæ adhærere, et in eam se inserere, testis est." But while he adduces the authority of Verdier, Rouhault, Noortwyk, and Denys, as in favour of the statement, that minute arteries proceed from the convex surface of the *placenta*, and, penetrating the *chorion* obliquely, pass into the womb, he nowhere expresses his own confidence in this statement; but, on the contrary. soon after refers to the experiments of Alexander and Donald Monro, and also the facts adduced by Roederer, to show that no direct vascular communication exists between the *uterus* and *placenta*. It is only requisite to peruse the subsequent part of this section, Lib. xxix. Sect. 3, and § 28, to be satisfied that, while Haller states all the then ascertained facts, he does not himself adopt the idea of direct vascular communication. Nay, according to the testimony of Dr Donald Monro, who was the pupil of Haller at Gottingen, that physiologist assured him, that what he had written was on the authority of others, and not from his own observation; and that in the bodies of those pregnant women which he had inspected, he found no *anastomosis*, and therefore did not believe in its existence.—(Essays, Phys. and Lit. Vol. i. p. 404.)

Of the experiments of Dr Alexander Monro, (Medical Essays, Vol. ii. Art. 9,) and the experiments of Dr Donald Monro, (Essays and Observations, Phys. and Literary, Vol. i. p. 408–419,) M. Velpeau makes no mention; though the former author denied direct *anastomosis* of the uterine vessels and the placental arteries, first on very natural and adequate grounds, viz. the large size of the former and the small size of the latter—(§. 16, p. 154,) and then on the evidence of injection; and the latter drew the positive inference, that "there is no *anastomosis* between the uterine and secondary vessels."

In his subsequent observations on this point, we find nothing new, and very little satisfactory; and it is singular, that, though William Hunter was the first who very positively maintained the direct vascular communication between the womb and the *placenta*, M. Velpeau not only omits to notice this circumstance, but does not attempt, in the proper place, to show whether the conclusion was well founded or erroneous.

Nor does he assign their due importance to the dissections and observations of Dr Lee, but merely notices them in a cursory manner, and not in the correct chronological order, after speaking of those of Mr Radford. Now, as the observations of Dr Lee were not only the first in point of time, and therefore the most original, but, as they differed so much from the representations of Hunter and his adherents, as to give rise to much discussion and controversy, we cannot see much use in a work like that of M. Velpeau, unless the author states how far, according to his own observations, they accorded with, or differed from, the appearances afforded by his numerous preparations. M. Velpeau, indeed, admits that the statements of Dr Lee, that the large vessels of the womb do not communicate with any corresponding vessels of the *placenta*, are perfectly well founded, and consonant with facts. But he maintains that Dr Lee is in error in representing the *decidua* to be interposed between the womb and the *placenta*, and in accordance with his views in the application of the *ovum*. We have already seen that M. Velpeau believes himself authorized to maintain that the *chorion* adheres directly to the uterine surface without the interposition of any intermediate membrane, such as the *decidua*; and it cannot be expected that he should renounce this view even on the testimony of Dr Lee and Mr Owen. It must be remarked, nevertheless, that the whole question resolves itself into one of individual observation; and that every person who has examined the objects carefully with his own eyes, even M. Velpeau, admits that the uterine sinuses are closed by membranous pulpy matter. We have also seen that M. Breschet maintains the interposition of *decidua* or *perione* between the *uterus* and *placenta*; and we must say, that, in the few instances in which we have had an opportunity of examining the contents of the gravid womb, *in situ*, in the persons of females who have died in the course of pregnancy, we have observed a pulpy, soft, membranous matter, variable in thickness, interposed between certain parts of the womb and the *placenta*.

Upon the whole, we think it likely, that, at the commencement of utero-gestation, either the *decidua*, or a similar substance, is interposed between the *ovulum* and the part of the womb to which it is applied; that, after the *chorion* is attached and the *placenta* is developed, the pressure and the circulation produce a degree of absorption of the interposed membrane; and that this may proceed to such an extremity as to cause almost the disappearance of the *decidua* at this point at the full time, unless at the orifices and the margins of the orifices of the large vessels, where it continues to be necessary, in order to prevent hemorrhage. At all events, it is an anatomical fact, that at these points a soft membranous matter is observed.

In his subsequent observations on this subject, we find that M. Velpeau opposes the doctrine of Hunter and his adherents, as to the blood being deposited from the uterine sinuses into the alleged cells of the *placenta*, and thence conveyed by vessels to the *fœtus*, in the following manner. 1. In extra-uterine pregnancies this arrangement is inadmissible. 2. The *placenta* consisting till the third month of agglomerated filaments only, no sinuses can exist between its lobules. 3. It is ascertained that the *placenta*, when attached to a fibrous polypus and hardened point of the womb, has, nevertheless, furnished all the necessary materials of nutrition. 4. He has seen the uterine surface of a recently delivered female hard, leathery, and without orifices. 5. The large canals of the womb alleged to terminate in the *placenta* are veins, according to the partisans of this doctrine, and that, consequently, it must be venous, not arterial, blood which is circulated to the *fœtus*.

From these facts and arguments, M. Velpeau infers that the *fœtus* does not receive from the womb blood completely elaborated, but a fluid differing in chemical properties and general constitution, in being more serous, less coagulable, and of much smaller globules. To us it appears that it is at once absurd, physiologically erroneous, and a piece of coarse mechanical reasoning, to imagine that it is necessary for the *fœtus* or *ovum* to receive blood in any shape from the *uterus*. What is the use of the complicated but beautiful arrangement of membranes, vessels, and *placenta*, unless it were that these parts were perfectly competent to derive the materials of blood from the womb, without the intervention of actual vascular canals conveying red ready-formed blood? Physiologists in this inquiry seem to forget or overlook the fact, that the *ovum*, after fecundation, is a new being, which has received the principle of life, and that, by virtue of this principle, it is quite capable of attaching itself to any living tissue, and deriving from that tissue the materials of nutriment, as is abundantly evinced in Fallopian, and also extra-uterine pregnancies, in which the *peritoneum* serves as a uterine surface for a time. That the *ovum* should derive its nutrient materials from the uterine surface, which is adapted to this purpose, is so much less wonderful, when we consider the size of this organ, its vascularity during pregnancy, and its faculty of diverting the current of the circulation from other organs to itself.

It is, however, high time to direct our attention to the account of the *vesicula umbilicalis*, the *allantois*, and the *vesicula erythroidea*, given by M. Velpeau, as a part of the history of the *ovulum*, by far the most obscure, the least understood, and the clear comprehension of which is perhaps the most likely to explain some of the difficulties with which the subject is embarrassed.

We have already adverted to the history of the *vesicula umbilicalis* to the time of the most recent accurate observer, Lobstein.

It appears, from the observations of M. Velpeau, that the recognition of this body is beset with various difficulties. In the *first* place, the embryon may die or may cease to grow, while the rest of the *ovum* continues to be developed. *Secondly*, the *vesicula umbilicalis* may be atrophied, converted into a hydatid, or detached from its stalk before the usual time. *Thirdly*, the *amnios* and *chorion* may continue too long detached, or may, on the contrary, approach prematurely. And, besides these causes, various diseases, by deforming the embryon, may act more or less directly on some of its parts, and may readily either destroy the *vesicula*, or modify it so far, or give rise to other products in its stead, as to deceive the observer completely. It has hence resulted, M. Velpeau thinks, that the descriptions of the *vesicula* by different authors have varied extremely, and cannot be reconciled without perfect knowledge of the circumstances now mentioned.

It is certainly a tolerable confirmation of the statements now made, that M. Velpeau, among nearly 200 *ovula* or uterine products, found the *vesicula umbilicalis* in a state which might be named natural only thirty times. From the attentive and careful comparison of these, he conceives that he has established the following facts.

The *vesicula umbilicalis* is a small pyriform globular or spheroidal sac, which, after the fifteenth or twentieth day of fecundation, possesses the bulk of a common pea, that is to say, is from two to four lines in diameter. It is probable that it acquires its greatest dimensions in the course of the third and fourth weeks,—since after one month, M. Velpeau has always found it to be smaller. Before the end of the first fifteen days, indeed, he acknowledges that he had occasion to examine only one, which was also less voluminous. When it is reduced to the size of a coriander-seed, which takes place towards the fifth, sixth, or seventh week, it usually ceases to diminish; but it then becomes flat, and disappears insensibly. In some instances it cannot be found in the third month; while in other circumstances we meet with it in *ovula* of four, five, or six months (41).

The *vesicula* is unquestionably situate between the *chorion* and *amnion*; and the reason why M. Velpeau, in 1824, maintained the negative was, that he had confounded it with a vesicular or bladder-like body, which to a certain extent resembled it, though, in point of fact, it was very different. Considering the proper membranes of the *ovulum* as a dependence of the embryon, it was almost impossible for M. Velpeau to understand the communication of this *vesicula* with the intestine, or with any other abdominal organs, unless by admitting that it was naturally placed at the exterior of the *chorion*.

As the *vesicula* is constantly enveloped to the thirtieth or fortieth day in the reticular body,—a membranous substance interposed between the *chorion* and *amnios*, and containing in its cells a clear jelly-like fluid,—it is requisite, in order to find it, to search in the midst of this matter. Though it remains sometimes free, and contracts adhesions eventually with no other part, most frequently, nevertheless, it is applied and attached either upon the external surface of the *amnios*, or upon the inner surface of the *chorion*. It appears, then, that it is enclosed between the folds of one or other of these two membranes; and thus M. Velpeau has most frequently met it, though he has also sometimes found it entirely floating in *ova* of two or even three weeks.

The characters of the *vitelline pedicle*, or the stalk by which the *vesicula* is attached to the embryon, vary according to the stage of pregnancy. To the close of the first month, and in the natural state, M. Velpeau has found it not less than two, nor more than six, lines in length, and about one-fourth of a line thick. At its junction with the *vesicula*, it undergoes a sort of funnel-like expansion, and though towards the abdomen it does not enlarge, neither does it contract sensibly. Its continuity with the intestinal tube cannot be questioned in the human *fœtus*; and before the formation of the abdominal parietes, it seems to be divided into two portions by the *amnios*, which it appears to have traversed or perforated, one being placed between spine, and the point afterwards occupied by the *umbilicus*,—the other externally, or between the umbilical point and the *amnios* and the *vesicula*.

After the first month, the stalk of the *vesicula* lengthens, and becomes more and more delicate; while its abdominal portion is lost in the chord, and can no longer be traced into the *abdomen*. Its length may proceed to half an inch, an inch, or an inch and a-half; but when longer than this, he infers that it must have been ruptured,—a circumstance depending on the traction of the membranes, when the *vesicula* has contracted adhesions to them; and upon the early or late occurrence of this rupture, the strength or feebleness of the adhesions, the more or less advanced period of pregnancy, depends the remoteness or proximity of the vitellar organ of the *embryon* to the umbilical chord, or its proximity to, or remoteness from, the circumference of the *placenta*. To the twentieth or thirtieth days this pedicle was found hollow by Velpeau, in opposition to the inferences of MM. Emmert, Hoechstetter, Cuvier, and others.

The walls of the vitelline sac are strong, resisting, thick, and not easily lacerable,—smooth and regular, when the *vesicula* is distended; but they become wrinkled, or plaited when it is empty. They are generally of a yellowish colour.

Those who have observed the *vesicula umbilicalis* in the bodies of brute animals, and who have admitted its continuity with the intestinal tube, represent it to be formed of three tissues,—a serous, a mucous, and a muscular. As the same contiguity exists in the human race, it would be equally just to allow it here to have three tunics, as M. Dutrochet believes. But, in the *first* place, this is a mere supposition; and, in the *second*, the three layers observed in the intestinal tube in adult animals are still imperceptible in the beginning of pregnancy. We shall see presently what uses M. Velpeau ascribes to this body.

We have already given a general description of the position, course, and character of the omphalo-mesenteric vessels. They are, indeed, arterial and venous vessels, which are distributed to the *vesicula umbilicalis*, and which the present author observed not only in the substance of the walls of the vitello-intestinal tube, but in those of the *vesicula* itself,—twice in the latter, and more than twenty times in the umbilical chord; and to which, in consequence of their connection with the first body, M. Velpeau thinks the name *vitello-mesenteric*, or simply *vitelline vessels*, is more justly applicable. According to his observations, they do not terminate in the trunk of the superior mesenteric vein and artery. He states that he has often traced them from the abdominal cavity through the umbilical ring as far as one, two, or even three inches in the chord, upon embryons of six weeks, two, or even three months; but at these different periods they were at length lost before arriving at the *vesicula* in the spongy tissue of the umbilical stalk,—a result which the author attributes to the same causes which produce obliteration of the vitello-intestinal tube. When injected, they presented the size of a thick hair; but in general they are extremely delicate.

The fluid of the *vesicula umbilicalis* M. Velpeau, agreeably to the views of various physiologists, regards as a nutritious substance—a species of oil—similar to that which constitutes the vitelline fluid of the chick.

On the subject of the uses of this apparatus, the views of M. Velpeau are rather vague and general. He conceives that its emulsive fluid is to contribute to the developement of the embryon until the chord and the vessels are formed, and until the *ovulum* is exactly applied to the inner surface of the womb; but he does not proceed to more particular or detailed inquiry. The *vesicula umbilicalis*, in short, of the human fœtus, is, according to him, analogous to the vitelline sac of the chick, which it resembles in shape, position, its connection with the intestines, the structure of its parietes, and the characters of the fluids which it contains. He allows, however, that it differs from this organ in this respect, that in the chick it enters the *abdomen* entirely, while in the human embryon it recedes from the *abdomen* in proportion as pregnancy advances.

We come next to the observations of M. Velpeau upon the characters and nature of the *allantois*.

It is well known that this name was applied to a membrane placed between the *chorion* and *amnios* of the *ovum* of the bitch, the sheep, the cow, and some of the reptiles, as well as the birds; and its existence has been alternately maintained and denied by anatomists in the *ovum* of the human female. It seems extremely doubtful whether this body was ever seen in the human subject; for the objects witnessed by Albinus, Boehmer, and even Hale, and perhaps by Munniks and Eglinger, appear to have been examples of the *vesicula umbilicalis;* and Haller concluded, that most accurate anatomists since the revival of dissection have, with justice, rejected the *allantois* as a part of the human ovuline structure. Even in other instances the appearances taken for the *allantois* seemed to have been produced by rupture of the *vesicula umbilicalis;* and this especially appears to be applicable to the observations of Needham, Diemerbroeck, Hoboken, and Littre.

After examining a great number of *ovula*, the details of eleven of which are given in the work before us, M. Velpeau finds, that, from the fifth week of conception to the end of pregnancy, the *chorion* and *amnios* are separated by a transparent layer, colourless, or of a slightly greenish colour, not serous, but lamellated like the vitreous lens of the eye, and diminishing in thickness in proportion as the other membranes are developed; and through which might be recognised slender cobweb-like filaments. As it diminishes in thickness, it forms at length a homogeneous pulpy layer, and is converted into a simple gelatinous or mucous coating, which eventually disappears entirely in most females previous to delivery. Several of its *lamellæ* adhere to the outer surface of the *amnios*, chiefly at the root of the umbilical chord, and less frequently to the inner surface of the *chorion*; and it is generally continuous with the gelatinous matter of the chord, (*gelatina Whartoni*). This body, the existence of which M. Velpeau conceives he has been the first to demonstrate, and to which he proposes, by reason of its structure, to apply the name of Reticulated Body (*corpus reticulatum*), he also represents to be quite analogous to the *allantois* of oviparous animals, (Pp. 53, 54). He denies, however, that either the reticular body of the human *ovum*, or the *allantois* of the oviparous *ovum*, has any relation to the kidneys or the bladder.

If these representations be just, and if they be confirmed by subsequent research, it must result that the description of the *allantois* given by Meckel is totally fanciful, or at least must have been derived, not by inspection of the human *ova*, but by inference from the phenomena observed in the *ova* of the lower animals.

The last object claiming attention in this inquiry is that denominated the *vesicula erythroidea*, or *tunica erythroidea*. To a body known by the latter name, and found in the ovular products of several of the mammiferous animals, Blumenbach conceived that the *vesicula umbilicalis* of the human subject bore a close analogy, (Sect. xxxix. § 573). Dr Pockels of Brunswick, however, described in the Isis of Oken in 1825, a pyriform bladder, larger than the *vesicula umbilicalis*, and from which he contends that it is entirely distinct. In this body, which ceases to exist about the third week, the intestinal canal is formed according to Dr Pockels, who farther states, that "at the period at which the embryon passes into the cavity of the *amnios*, the large extremity of the erythroid vesicle is detached from it to form the *abdomen* of the *fœtus*, which is withdrawn into the sheath formed by the coats of the *ovum*, and fills it completely." He then adds, that "in the human *ovum* this tunic thus becomes the umbilical chord; and that, as the change takes place in the third week, after this period in well-formed *ova*, the *vesicula erythroidea* is no longer found at the surface of the *amnios*."

In the only instance in which M. Velpeau thought he had met with this variety of structure, the bladder, which he observed had no relation with the intestines, was completely opaque, acquired a large size, and had no continuity with the *vesicula*, and continued larger than even in a well-formed *ovum* of from three to four weeks. M. Velpeau has never met with a vesicle corresponding exactly with that described by Dr Pockels;—and he farther adds, that none of the *ova* represented by that observer are in the natural state. Upon the whole, it may be inferred, in the present state of knowledge, that the erythroid vesicle is an apocryphal object entirely, and that Dr Pockels has described some variety of the *vesicula umbilicalis*.

We here conclude the examination of the first part of the work of M. Velpeau, namely, that on the Investments of the *Fœtus*. This work exhibits, it may be remarked, a more systematic and comprehensive view of the subject than that of M. Breschet, whose researches in the part hitherto published have been confined chiefly to the consideration of the developement of the *decidua*, with such observations on the other membranes as that inquiry naturally and necessarily suggests. We have for this reason been compelled to follow chiefly the order observed in the work of M. Velpeau, although we have at the same time brought under notice the researches of M. Breschet, so far as they proceed.

The second section of the work of M. Velpeau, which is devoted to the inquiry into the Formation of the *Fœtus*, we shall reserve to a future opportunity.

In the meantime, we cannot conclude this article without observing, that, though we have very freely criticised the views and the reasonings of both authors, and have occasionally noticed errors and omissions,—considering, however, the extreme difficulty of the inquiry, we must say, that they reflect infinite credit on both. Of M. Breschet, more might certainly have been expected than the present, which is evidently an imperfect,—an embryal treatise, precipitated before the public in order to prevent M. Velpeau, his junior, from reaping all the honour of the inquiry in which both had been engaged. Notwithstanding this objection, it is an able essay, and would have assuredly commanded much attention, had not its merits been very much obscured, if not completely eclipsed, by the appearance of the more complete treatise of M. Velpeau.

The latter is a work of great interest and importance, and will doubtless command the attention of physiologists and accoucheurs in every country. Though the arrangement is not always very clear or methodical, the author studies to present full details on all points, and he certainly gives the most complete history of the fœtal investments extant. Occasionally he makes vague and general statements; and sometimes, when we expect to find a simple description of facts, we are amused with long speculative disquisitions. We should have been better pleased if he had always distinguished accurately between mere descriptive facts and speculative opinions and deductions.

Meanwhile, it is but just to say, that, to most of these evils, the great antidote is found in the monographic illustrations, and their explanations. These engravings contain an assemblage of most valuable facts, and will communicate, in the course of a few days, more information on the anatomical peculiarities of the *ovum* at the different stages of its developement than books and lectures will do for a long series of years. While the selection and exposition of objects is highly creditable to M. Velpeau, the delineation is not less so to the artist, for distinctness, fidelity, and accuracy.

ART. II.—*A Treatise on Diseases of the Eye.* By W. LAWRENCE, Esq. F. R. S., Surgeon to St Bartholomew's Hospital, &c. &c. &c. Pp. 730. London, 1833.

A WORK on Ophthalmic Surgery, by one of the most eminent surgeons in the metropolis, cannot fail to be interesting to the profession, and to contain much valuable practical information; and the celebrity of the author, both as an accomplished surgeon and a skilful oculist, must invest his opinions with a high degree of importance, and entitle them to very deliberate examination.

The object set forth in this treatise of Mr Lawrence, is to describe the nature and treatment of diseases of the eye and its appendages; with such an account of the anatomy and physiology of these organs as is necesssary for practical purposes.

In his introductory remarks, Mr Lawrence confirms the observations of others, by stating, in a short, judicious, and powerful manner, the value and importance of the sense of sight,—the great responsibility which lies with surgeons, in being the means of saving or destroying a patient's vision,—the necessity for the particular study of the subject, especially to country practitioners, who have to depend solely on their own resources,—and the superiority of concentrating a sufficient number of cases for this purpose in an ophthalmic hospital. Mr Lawrence also shows that ophthalmic diseases require a correct knowledge of anatomy and physiology, and can only be studied properly, or treated judiciously, by those who have studied the structure, functions, and diseases of the body generally. For the numerous organs are only "subordinate parts of one great machine; and they all concur, each in its own way, in producing one general result, the life of the individual." To understand any part of the body thoroughly, we must know the whole. In diseases of the eye, we must look to the state of the circulation, the digestive system, the patient's habits, his diet, and such causes as may operate on the eye. "We ultimately find," says Mr Lawrence, "that the eye must be cured, not by any direct or local measures, but by those of general influence; by loss of blood, purging, change of diet, and other habits." The habits of the mere oculist "lead to a separation and insulation of the organ. The part is detached from the system, treated by washes, drops, ointments; and this inefficient trifling impedes the progress of ophthalmic surgery." And Mr Lawrence might have added, causes the loss of many valuable eyes to industrious individuals, and important members of society.

Mr Lawrence concludes his introductory remarks by giving a short outline of the history of ophthalmic surgery, to which we refer our readers who are curious on the subject.

The Anatomy of the Eyeball.—In treating of this head, Mr Lawrence says, "The essential constituents of the eye are, transparent media to refract the rays of light; a nervous expansion to receive the impression produced by the rays thus refracted; and certain membranous opaque coverings, surrounding, connecting, and protecting the foregoing parts."—P. 13. But in this he has very strangely omitted a very essential part, viz. its connection with the brain or nervous system, without which, as an organ of vision, it would be quite useless. Indeed all the other parts of the eye are only subservient to the protection and functions of the nervous part, and its connection with the brain. Mr Lawrence again, at page 14, says, in speaking of the coats of the eye, "only the external or fibrous layer is complete, that is, closed in all directions." If we admit, however, the *sclerotica* to be completed *anteriorly* by the *cornea*, still there is an aperture *posteriorly* for the transmission of the optic nerve into the interior of the eyeball. Of the *sclerotica*, *cornea*, *choroidea*, *iris*, *retina*, and humours of the eye, Mr Lawrence gives a short and common-place description. Regarding the nicer points upon which his opinion and observations would have been interesting, such as the muscularity of the *iris*, the existence of a membrane surrounding the aqueous humours, and the connection of the lens with its capsule, Mr Lawrence gives no opinion, but states some of the opinions which have been entertained by others.

Physiology of the Eye.—Of the physiology or functions of the eyeball, and of the anatomy and physiology of the appendages of the eye, Mr Lawrence gives a short account. Upon these we shall not enter, but proceed to the more important part of the work on the diseases of these parts.

Chapter I.—*Pathology of the Eye—Inflammation—Classification of Ophthalmic Diseases.*—Here Mr Lawrence proceeds to show that, from the analogous nature of the component parts of the eye, and their necessary connection with other parts of the body, the diseases of the eye and their treatment cannot be considered apart from general pathology, or treated entirely as local ailments. "Within the small compass of the visual apparatus," says Mr Lawrence, "we meet with a greater variety of structures than in any other part of the body. We have seen, indeed, in the preceding description, that the eye with its appendages exhibits specimens of every animal tissue in the body. We find in it bone, cellular and adipose substance, and blood-vessels; mucous, fibrous, and serous membranes; the *conjunctiva* exemplifying the first, the *sclerotica,* the sheath of the optic nerve, and the lining of the orbit, (*periorbita,*) the second, the surfaces containing the aqueous humour, the third; muscular, nervous and glandular parts; common integument and hairs. Besides these, it contains several tissues of peculiar nature, to which there is nothing strictly analogous in other parts; these are the *iris,* the ciliary body, the choroid coat, and the transparent *media.* Each of the latter has its own characteristic structure; the *cornea,* the crystalline lens, and its capsule, the hyaloid membrane, and the vitreous humour, resemble each other only in being transparent. Most of these parts are highly organised, copiously supplied with blood-vessels and nerves.—P. 60. After noticing the connection which exists between the eye and the other parts of the body, as by the common source of nutrition and circulation, the ramifications of the nervous system, the continuity of mucous surfaces, and common integuments, our author remarks, "It will be clear, from the preceding considerations, that the affections of the eye, as a part of the organic system, come under the general laws of disease and treatment. We must, however, not lose sight of its peculiar tissues, and of the modifications which fit the organ for its especial office. It would be a most fatal error to insulate the diseases of the eye from the rest of pathology, to consider them as merely local ailments, and treat them only by remedies applied to the part."—P. 61.

The complex structure, liability to disease, external situation, and the possibility of examining its interior parts, render the eye an organ peculiarly favourable for the study of disease,—observing the changes produced by it, and for establishing correct pathological doctrines. We shall, therefore, enter pretty fully into the subject, in order to convey to our readers a proper account of the pathological opinions and doctrines of the author; for, on the one hand, these are highly interesting and important to every practitioner; and, on the other, they proceed from one of the most talented and learned in the profession.

In the following sentence, Mr Lawrence anticipates the foundation of his pathological doctrines. Speaking of the numerous diseases of the eye which have been described, he says, "We shall find, however, on closer inquiry, that this numerous offspring belongs, nearly all, to one family; that, although designated by distinct appellations, they are not distinct diseases;

but that the great majority are merely forms and results of one morbid affection, viz. inflammation."—P. 62.

Inflammation, then, according to Mr Lawrence, forms the most important subject of pathological inquiry, being "more and more generally recognized as the source of disease; and it seems likely, in the end, to spread itself over nearly the whole field of nosology."—P. 62.

Mr Lawrence remarks, that the common description of inflammation is, that it consists of redness, heat, swelling, and pain of a part. But "as a mere description, it is not applicable to the eye in many cases. In some conditions of the *cornea*, the *iris*, and the crystalline capsule, which are regarded as inflammation, there is no visible swelling, no redness, nor can we detect the existence of heat or pain. Again, in the case of parts removed by their situation from direct observation, as the *retina* and hyaloid membrane, or the various internal organs of the body, we cannot determine whether the four circumstances regarded as criteria of inflammation are present or not.

"The question, however, what is inflammation? is not satisfactorily answered by enumerating these four changes, even if we admit that their assemblage generally characterizes the process. Redness, swelling, heat, and pain, are the symptoms of the disease, the external signs that denote its presence. We must inquire, therefore, what is the internal change that produces these four external signs? what is the alteration in the capillary circulation, that gives rise to redness, swelling, heat, and pain? This is not yet known. We understand something of particular inflammations, as those of the skin, cellular tissue, serous and mucous membranes, &c., because we can both observe their progress, and examine the parts affected; but, when we attempt to explain the nature of inflammation generally, we are investigating an abstract term. In this point of view it is a creation of the mind, not conveying any sensible ideas; its acceptation, therefore, cannot be defined or limited by refeaence to nature, our only safe guide.

"The most general notion that we can form of inflammation, is that of increased activity in the capillary circulation, whether evidenced by increased size of vessels and redness, or by deposition of new matter and consequent visible changes, such as thickening or opacity, increased or altered secretions, and unnatural adhesions. The phenomena of inflammation, when it is seated in an external part of some size, as the hand and fore-arm, for example, show that an increased quantity of blood enters the inflamed part, and circulates through it. The throbbing and the increased size of the arteries, the distension of the venous trunks, with the fulness of the small vessels, as evidenced by the external redness, and by the unusual red colour of all the textures of the inflamed member, with the obvious increase in the number and size of their capillaries, prove that an increased quantity of blood enters the part. It seems to me equally evident that a larger quantity circulates through it. Blood flows much more freely from an incision into an inflamed part than into a sound one. This is strikingly exemplified in the division of the integuments and cellular membrane in phlegmonous *erysipelas*; both arteries and veins bleed so freely on such occasions, that twenty or thirty ounces of blood are often lost in a few minutes. When an operation is performed on an inflamed part, or in its immediate neighbourhood, the blood is thrown more forcibly from the divided vessels, and we find it necessary to tie a much greater number than under other circumstances. The fulness of the veins in an inflamed limb is another unequivocal proof of the same point: these vessels could not be distended, if the blood sent to the inflamed part stagnated in it, as some have supposed. In a case of inflamed hand and fore-arm, requiring general depletion, I have tried the experiment of opening a vein in each arm at the same moment. Three times more blood flowed from the vein of the inflamed limb, than from that of the sound one, in the same time. We are thus led to regard the phenomena of inflammation, that is, the changes which occur in the part itself, as dependent on an increased activity in the circulating system. But it is not merely increased activity, that would produce increased nutrition, augmentation of bulk, as in the growth of the stag's horn, the enlargement of the *uterus* and the mammary glands in pregnancy; there must be an alteration in the mode of action; but in what the alteration consists we are unable to determine.

"The agents of inflammation are the capillary vessels, which carry on the active business of the animal economy, performing the various processes of nutrition, growth, secretion and excretion. We do not yet know the differences of arrangement of action which lead to the various results of vascular excretion; we cannot tell how it is that the capillaries of one part deposit bone, those of another muscle, of a third membrane; how some secrete bile, others urine or saliva. As we know nothing of the causes which produce these striking differences, it is not surprising that the intimate nature of the process called inflammation should still be a mystery to us."—Pp. 63, 64.

Of the varieties of acute and chronic inflammation, Mr Lawrence remarks, that "inflammation is not one and the same process under all circumstances; if it were, pathology and treatment would be very simple." Mr Lawrence then proceeds to show that acute and chronic inflammation are essentially the same in their nature, differing only in degree and duration. "Believing inflammation," he says, "to be increased activity or exertion of the capillaries, I consider the expressions, passive, atonic, and asthenic inflammation, as applied to the state of the inflamed part, to be contradictory in terms."—P. 66. He also adds at page 67, "If there are any inflammations in which the capillaries are less active than in the healthy condition, I am not acquainted with them." But, at the same time that Mr Lawrence pronounces these decided opinions, he has also distinctly stated as to the nature of inflammation, that "the real nature of the process is as yet imperfectly known."—P. 62.

He afterwards repeats (p. 65) "that the exact nature of that deviation from the normal or healthy state of the capillary circulation which constitutes inflammation is as yet unknown." That Mr Lawrence should pronounce opinions so decided upon what he states to be imperfectly understood and as yet unknown, is somewhat remarkable, and unlike his usual acuteness. And he farther states, respecting the acute and chronic stages of the same inflammation, that "some have contended that the two periods are totally different in their nature; that increased exertion is the essence of one, weakness of the other; and that a corresponding difference of treatment is necessary, the chronic stage requiring, as they represent, tonic and stimulant means. These views seem to me altogether erroneous. Without asserting that there is no difference between the acute and chronic inflammation in general, I have no hesitation in affirming that the acute and chronic stages of one and the same inflammation do not differ in their essential nature."—P. 68.

Upon these subjects we have dwelt more particularly, because they are certainly of the greatest importance in a practical point of view, as they should form the foundation of our opinions and practice.

In examining attentively these opinions of Mr Lawrence, we certainly differ from him in several respects. For several reasons we cannot consider acute and chronic inflammation to be of their nature essentially the same. 1*st*, The symptoms are different—being in the acute rapid in their progress, painful, and soon producing peculiar changes; but in the chronic they are slow in their progress—their is little or no pain, and the changes produced by it are frequently very different from those in acute inflammation, while the redness, so far from lessening, as Mr Lawrence alleges, very often increases. 2*d*, The terminations of it are in general very different. The most common terminations of acute inflammation being resolution, adhesion, abscess, or gangrene; while chronic inflammation more frequently terminates in interstitial deposition, causing increase or thickening of the tissue affected, effusion, and ulceration. 3*d*, The remedies which effect a cure are different—in the acute, depletion and antiphlogistic means are the only beneficial remedies; whereas in the chronic, these very often aggravate the complaint; and an opposite treatment, consisting of nourishing diet, and the application of stimulants, speedily produces a cure.

That there is an increased action of the capillaries in acute inflammation we will not dispute; but we cannot admit that it consists entirely of this. There must be something more,—some peculiar action set up, the nature of which we cannot ascertain.

For we see in several instances increased action of the capillaries, without the peculiar morbid phenomena of inflammation; such as, by the immersion of an extremity in hot water, or in the erectile tissues. But though we cannot altogether deny that there is an increased action in the capillaries in chronic inflammation, we consider it to be of a very different nature from that in acute inflammation, and to be quite peculiar. The redness of the part increases, as in purulent *ophthalmia*, yet there is no pain, no throbbing—very little or no sense of increased heat. The application of stimulants produce great relief, and form the most beneficial mode of treatment. Certainly from this we cannot infer that the disease consists in an increased action of the capillaries, at least of the same nature as in the acute inflammation, where the symptoms are so different, and the application of the same remedies so aggravating and hurtful.

After explaining the views above described, Mr Lawrence says, " Thus we find that the acute form passes into the chronic, and that the latter may relapse into the acute. When inflammation of the eye has reached the chronic stage, all the phenomena of acute inflammation may be reproduced by exertion of the organ, imprudence in diet, or other causes. Finding that, within a short period, one stage can pass into the other, and *vice versa*, how can we admit the notion that the two are opposite in their nature and in the treatment they require?"—P. 68. Now, though we infer from this, that there is often an increased susceptibility in the vessels of a part affected with acute inflammation, to assume the chronic form, and *vice versa*, we cannot admit that the acute and chronic forms of inflammation are of their nature the same, as Mr Lawrence does. We have also seen quite enough to convince us that acute and chronic inflammation do require opposite modes of treatment.

There is no part of the body in which these doctrines can be so completely put to the test experimentally, and so clearly illustrated, as in the eye. When treating of the inflammations of the different parts of the eye, therefore, we shall again have occasion to allude to the subject.

Mr Lawrence, in presenting his preliminary remarks on the subject of inflammation, proceeds to enumerate the various effects of inflammation. He then points out the distinction between common and specific inflammation,—the varieties which occur from difference of texture of the parts affected,—and the modifications of the disease which occur from other circumstances,—such as the temperament, age, sex, habits, constitution, &c.

In describing the arrangement of the subject which he proposes to adopt, Mr Lawrence gives a preference to the following, as best adapted for the practical purposes he has in view, and which is the same he adopted in his lectures at the London Ophthalmic Infirmary. 1. Inflammations of the entire globe of the eye, of the external, and of the internal parts, including injuries and wounds of the organ; 2. Affections of the eyelids; 3. Consequences and concomitants of inflammation; 4. Cataract; 5. Artificial pupil; 6. Amaurosis, and other defects of vision; 7. General affections of the globe, dropsy, atrophy, &c.; 8. Affections of the lacrymal organs; and 9. Affections of the orbit.

Chapter II.—*Inflammation of the Globe (Ophthalmitis.)*—Mr Lawrence first treats of inflammation of the entire globe of the eye, which, though comparatively a rare affection, is sometimes met with. It is a very severe and distressing form of *ophthalmia*; and, from the cases we have seen of it, we can appreciate the correctness of the account here given of it. The great characteristic of this disease is the whole eyeball being at once affected, producing general pain, and swelling of the eye and surrounding parts, causing it to protrude from the socket. At first the *conjunctiva* and external parts are affected; then the *cornea*, *iris*, *retina*, and other internal parts partake of the inflammation. A febrile state of the system attends this affection; and, if the progress of the inflammation is not checked, its consequences are suppuration and bursting of the globe, by which the humours are evacuated, and the eye destroyed as an organ of vision. In slighter cases, or where the progress of the disease has been in some degree arrested, organic changes of less magnitude, but probably equally fatal to sight, may take place, —such as opacity of the *cornea*, closure of the pupil, effusion of lymph, or more or less disorganization of the *retina*.

Chapter III.—*Inflammation of the external proper Tunics; external Inflammation of the Globe.*—This chapter contains an account of inflammation of the *sclerotica* and *cornea*. It is characterized by the usual symptoms of acute *ophthalmic* inflammation, " external redness, pain, intolerance of light, increased *lacrymal* discharge, with more or less febrile disturbance of the constitution." The peculiar aspect of the external redness marks the seat of the disease. The redness begins immediately round the *cornea*, where it forms a red zone, formed by distended blood-vessels proceeding forward from the posterior part of the *sclerotica*. These enlarged vessels being covered by the *conjunctiva*, are of a lighter red colour than if they belonged to the latter membrane. The *sclerotica* becomes of a uniform faint-red or pink colour; and when the *conjunctiva* over it becomes inflamed, the difference in the appearance of the vessels of the two parts is quite apparent; those of the *conjunctiva* being of a bright scarlet colour, lying naked on the surface of the membrane, and running forwards in an irregular and tortuous course. In very severe cases the *conjunctiva* assumes the appearance called *chemosis*. The effects of this form of *ophthalmia* are often very serious, by causing the transparent *cornea* to become opaque. Effusion of yellowish lymph takes place into its texture, and ulceration. If the ulceration takes place into the anterior chamber, the aqueous humour escapes, the *iris* comes forward into contact with the *cornea*, by which the anterior chamber is abolished, and a protrusion of the *iris* takes place. "In short," says Mr Lawrence, "the eye, so far as the purposes of vision are concerned, is lost." This, however, is only the result of extremely bad cases; for, as Mr Watson of this city has shown, in a paper published in the 32d vol. (p. 22) of this Journal, when the ulceration of the *cornea* takes place into the anterior chamber, the protrusion and adhesion of a portion of the *iris* acts like a plug, and is the mean of saving the eye to be a useful organ. When ulceration does not take place, the effused lymph is frequently absorbed, but more or less opacity may remain.

Chap. IV.—*Causes of Ophthalmic Inflammation.*—These Mr Lawrence divides into two great classes, the *remote* or *predisposing*, and the *immediate* or *exciting*.

> "The organization of the body," he remarks, "is in relation to the influences which surround it, and these do not affect it while in a healthy state; but the least of them is capable of producing disease, when the body is prepared for their action by certain previous changes, which, although produced almost insensibly, are of great importance, as constituting the first links in the chain of morbid phenomena, the first steps in the transition from health to disease. A person in sound health encounters wind and weather, not only without harm but with benefit; he is not injured by atmospherical vicissitudes, by cold, heat, rain, draughts of air; while a little damp, or a puff of easterly wind, will bring on serious disease in sickly persons. The necessity of closely investigating these predisposing agencies in reference to the important object of preserving or restoring health, and thus preventing disease, is too obvious to require further explanation.
>
> "As the eyes are parts of a general organic system, connected with the rest by vessels and supply of blood, by nerves, and by reciprocal sympathetic influence in health and disease, the remote or predisposing causes must be the same for them, as for the rest of the body, and some of the immediate causes are at all events analogous. I shall first consider the latter, as their agency is the most obvious."—P. 86.

Immediate or exciting causes.—These are direct injuries, such as wounds of, or the introduction of foreign matter, particularly if of an irritating quality, into the eye. These "always excite inflammation, which will vary in degree according to other concomitant circumstances." Hence, Mr Lawrence remarks, that numerous highly irritating matters introduced into the eye under the name of remedies, when this delicate organ is already inflamed, often aggravate, or keep up, the disease which they are employed to lessen or remove.

Among the other immediate or exciting causes of ophthalmic inflammation are enumerated, the application of certain contagious substances, as the discharge from *gonorrhœa*, or purulent *ophthalmia*; excessive exertion of the eyes upon minute objects; air and light under peculiar circumstances,—as bad air, moist air, cold air, exposure to strong light suddenly applied, and more particularly if accompanied with heat, and reflected light from sand or snow. Particular colours also, when the eye is long applied to them, in some produce ophthalmic inflammation.

"The causes above enumerated admit of being divided into two classes. Some of them, such as external injuries, chemical substances, or morbid poisons, will necessarily produce more or less inflammation: one case may be serious, another slight."—"The other agencies, such as the application of cold and moisture, and excessive exertion of the organ, do not produce inflammation invariably."—"To produce disease, therefore, it is necessary not only that an exciting cause should be applied to the eye, but that either the part, or the individual, or both, should be in a state susceptible of the action of that cause."—P. 90. Of these remarks our author gives several apt illustrations, which our limits will not allow us to transcribe. "The same exposure," he adds, "or employment of the organ which would produce no inflammation in the sound eye of a healthy person, will, under certain conditions of constitution, excite inflammation. We must, therefore, inquire into those predisposing circumstances, which, though they do not immediately affect the organ, render the body susceptible of disease. In investigating these causes, we find the evidence much less clear than in the other cases. Those alterations in the constitution, which bring individuals from perfect health into a state susceptible of disease, are produced in a length of years, and by the continued application of influences, which do not act immediately or visibly at any one time. We cannot trace their direct influence, as we cannot see the hour-hand of a watch move; but we judge of it by the effects which are sensible after a considerable lapse of time."—Pp. 90–91.

Remote or Predisposing Causes.—"Among the predisposing causes of disease, the following are the principal." 1*st*, Natural peculiarities of organization, called temperaments and idiosyncrasies. 2*d*, Morbid dispositions, as scrofula, gout, rheumatism, which may be either hereditary or acquired. 3*d*, Age, sex, climate, and situation. *4th*, Habitual over-exertion or excitement of the eye. *5th*, Unhealthy states of constitution, as *plethora*, and deranged state of health from *over-living*, by indulging in excess of stimulating food and drink. These are certainly deserving of particular attention.

Besides the causes enumerated, of *ophthalmia* where there is some direct exciting cause applied to the organ, there are others without such immediate influence, which arise from disturbance in other parts of the body, as *ophthalmia* in *gonorrhœa*, or *syphilis*. Hence the former have been called *idiopathic*, the latter *symptomatic*.

Chapter V.—*Treatment of Ophthalmic Inflammation—Chronic Ophthalmia.*—In the treatment of ophthalmic inflammation, Mr Lawrence very properly begins by stating the necessity for removing the cause. This, of course, consists in the removal of extraneous matter and foreign bodies, and counteracting as far as possible the effects of chemical agents. For the removal of foreign bodies from the inside of the eyelids, Mr Lawrence recommends, what is now the general practice, of everting the eyelids, and causing the patient to turn his eyeball upwards or downwards, as may be required for discovering and removing foreign bodies from the reflected folds of the *conjunctiva*.

Mr Lawrence treats of the various means to be employed for the removal of ophthalmic inflammation, consisting of general and local blood-letting; purgatives and regulation of the diet; and other internal remedies as auxiliaries to these, consisting of antimony, mercury, and blisters. He also recommends several external applications, hot and cold.

In all cases of considerable *ophthalmia*, Mr Lawrence relies chiefly on general bleeding, which has a decided effect in reducing the vascular action of the eye, as is obvious in such cases where it is practised to a proper extent. "You see," he says, "a person with the eye bright red, and very painful; he cannot face the light, and tears gush out with great suffering if he attempts to do so. You bleed to fainting, and immediately the capillaries are emptied, so that the organ resumes its natural paleness; the pain has gone, the eye is opened without difficulty, and the full influx of light can be borne without an uneasy sensation. For the time the part has passed from violent inflammation to a nearly natural state; and we cannot doubt that the change thus produced must have a powerful effect in arresting the disturbance. With the restoration of the circulation, the inflammation will recur after this temporary suspension; but its violence is diminished, and it often gradually subsides. General bleeding, then, is necessary in inflammation of the eye, to prevent the changes of structure that would subsequently impair the functions of the part."—P. 105.

"The quantity of blood to be drawn from the arm must be such as will decidedly affect the circulation. We cannot determine the amount beforehand; we cannot decide that ten, twelve, or sixteen ounces will be sufficient; it may be necessary to take twenty, thirty, or forty ounces, or to produce syncope, if you cannot otherwise make the requisite impression on the vascular system."—"I believe," adds Mr Lawrence, "that it is the usual practice in France, Italy, and Germany, to take a small quantity of blood at a time, and to repeat the bleeding frequently; thus venesection is not unfrequently performed night and morning for several successive days. This plan, which is adopted from the fear of injuring the patient by a large bleeding, drains his circulating system almost to the last drop, brings on excessive debility, and is less efficacious in arresting the local disorder. I have no hesitation in stating, that the object last mentioned is effected much more certainly by a large bleeding in the outset, and that this method accomplishes it at less expense to the constitution. I never saw a person injured by a single large bleeding performed for an active inflammation; while generally the strength is completely restored in twelve or twenty-four hours, even after bleeding to syncope. On the contrary, weeks and months often elapse before patients, who have been drained by repeated bleedings, recover their strength.

"As the restoration of the digestive functions and the secretions diminishes the symptoms, where inflammatory fever is present, they, who are afraid of weakening by loss of blood, recommend in preference aperient and diaphoretic medicines. If you examine the history of cases treated in this way, you find that two, three, or more days are employed in these indirect attempts. Purgatives are given which do not operate; diaphoretics are tried, which bring on no discharge from the skin; the local inflammation increases, the general disturbance is aggravated, until the fever comes to an end, when the secretions and digestive functions are consequently restored. Abstraction of blood to a proper amount accomplishes the desired objects at once. When you have thus removed the load that oppresses the system, the suspended secretions are restored, evacuation of the bowels takes place speedily, and the patient breaks out into a profuse perspiration. Thus the sufferings of the patient are materially abridged, while the duration of the local disturbance is shortened; the latter being a very important point in the case of the eye."—Pp. 105,–107. These are highly important remarks, and are well deserving of attention. And we firmly believe they might be confirmed by the experience of most of our chief practitioners.

Local bleeding, by the application of a sufficient number of leeches, never less than from twelve to twenty for an adult, aplied either around the eye, or upon the eyelids, or by cupping from the back, may be resorted to in slighter cases, or after the urgent symptoms have been subdued by general bleeding. The administration of purgatives, such as are in common use, and rigid attention to low diet, consisting only of diluents, composed of farinaceous substances and other vegetables, require to be strictly enjoined.

Of nauseating doses of antimony, Mr Lawrence does not speak in terms of commendation; but of mercury, in lessening inflammation, he speaks very favourably, and is to enter more at length upon it when treating of internal *ophthalmia.*

Of counter-irritation by blistering, the remarks of Mr Lawrence are well deserving of attention, and appear to us to be of greater importance than may be generally supposed. We shall therefore quote his own words.

> " When inflammation has been checked by the means already specified, counter-irritation by blisters may hasten its removal, may prevent it from going into the chronic stage. An active inflammation in its full developement, with all its sympathetic consequences, cannot be stopped in this way. Blistering under such circumstances only adds to the existing irritation, and increases the patient's sufferings. The blisters should be applied at the back of the neck, or behind the ears: in active inflammation they should never be placed nearer to the eye than these situations. When they are applied to the forehead, temple, or side of the cheek, the inflamed organ may be included within the sphere of their irritation, with aggravation of the local symptoms: in this way I have often seen them decidedly injurious."—P. 112.

In the use of warm or cold applications to the eye, Mr Lawrence has not much reliance; but, he observes, " they relieve uneasiness, and patients have much faith in them." As warm applications, Mr Lawrence recommends warm water, the decoction of poppy, of chamomile, and the steam of hot water. For cold applications, he recommends cold water, rose water, iced water, and saturnine lotion, alone or with the addition of a little spirits and vinegar to increase evaporation.

Treatment of Chronic Ophthalmia.—In the treatment of chronic *ophthalmia* Mr Lawrence is, as might be expected, influenced by his views of the nature of disease. " Since chronic inflammation," says he, " is the same as acute in its essential nature, the difference being only in degree, it must be treated on the same principles."—P. 117. Local or even general bloodletting, Mr Lawrence considers often very beneficial. In chronic *ophthalmia* there is often states of excitement or acute inflammation in which this will certainly prove beneficial; and the antiphlogistic treatment requires to be pursued, though in a less active manner. " The regulation of the state of the digestive organs is a matter of considerable importance," by clearing out the alimentary canal, and regulating properly the diet of the patient. In this form of *ophthalmia*, Mr Lawrence considers a moderate allowance of animal food admissible, but no species of fermented liquors. Along with this he recommends, for the correction of disordered stomach and bowels, small doses of blue pill with aloes, compound extract of colocynth, or extract of rhubarb; and, when the nervous system is in a debilitated state, tonics, pure air, bodily exercise, and tranquillity of mind, are to be employed.

> "If the powers of the system should be really reduced by the long continuance of disease, and the necessary treatment, it may be expedient to adopt direct measures for invigorating the system. Nutritious diet, the moderate use of fermented liquors, good air and exercise, are the best restoratives: these should be combined with moderate use of the organ, which should be freely exposed to the air, and as much to the light as its irritability will allow. If the debility should seem to require, and more particularly if the patient should think that it calls for, the aid of the materia medica, we must employ the vegetable tonics and mineral acids."—P. 119.

Combined with the above general treatment, Mr Lawrence recommends counter-irritation by means of tartar-emetic ointment rubbed on behind the ear, or on the back of the neck, or a seton or issue in the temple.

Local Stimuli and Astringents, Mr Lawrence seems to consider as very inefficacious for the removal of chronic *ophthalmia*. Hence he speaks as if he believed that no benefit is to be derived from the use of *Vinum Opii*, brandy and water, solutions of alum, sulphate of zinc or copper, nitrate of silver, or oxymuriate of mercury. But, in cases of purulent *ophthalmia*, he admits they have a more decided effect, as will afterwards be shown.

Mr Guthrie of London has extended the use of stimulants in ophthalmic inflammation. "But it remains," says Mr Lawrence, "for future experience to decide on the merits of the local treatment recommended by Mr Guthrie."—P. 125.

Having finished the analysis of perhaps the most important part of the work of Mr Lawrence, we shall reserve the account of the concluding part for next Number, as our limits will not admit of it at present.

Before concluding, however, we feel it to be our duty to advert to the external form of this volume, as one in every respect deserving commendation. The materials, from the specimen already examined, it will be seen, are extremely valuable, and comprise almost every thing that deserves to be known, pathologically and therapeutically, on the diseases of the eyes. What is of not less importance, both to the practitioner and the student in the present era so prolific of books, is the methodical arrangement and condensed form of the volume. We are happy to observe, that Mr Lawrence or his bookseller has been studious to confine the whole within one close, but well-printed volume, and has thereby put the student of ophthalmic surgery in possession of a moderately-sized work, which contains almost every thing that he requires to know. Notwithstanding this attention to economy, the volume is very neatly and handsomely printed, and is altogether creditable to the parties concerned. We have no doubt that it will speedily recommend itself to general attention, and occupy a place in every complete medical library.

ART. III.—*A New Exposition of the Functions of the Nerves.* By JAMES WILLIAM EARLE. Part 1. 8vo. London, 1833. Pp. 195.

IF the advancement of any branch of science were to be measured by the number of experiments and treatises purporting to explain it, our knowledge of the functions of the nervous system might be supposed to equal that of any branch of physical science. Scrutinized by metaphysicians, who therein hoped to find an explanation of the mysterious connection of mind with matter, and their influence upon each other,—minutely traced by the most accurate and laborious anatomists of whom medical science can boast,—and viewed with all the light which pathology and innumerable experiments performed on the lower animals have thrown on the subject,—our acquaintance with the functions of the nervous system is confined to the knowledge of a number of unconnected facts, if we except the discoveries of Flourens, Bell, and Magendie.

The causes which so long retarded all the branches of science, and more especially those connected with medicine, continued to operate in physiology long after they had ceased to act on the rest. Sweeping conclusions were drawn from a few experiments, frequently ill-devised and ill-performed,—fancy supplied what was wanting in facts, and ingenuity stood in the place of rigid induction. A nervous fluid, vibrations, and electricity, have, each in its turn, been employed to support the doctrines of various writers on the physiology of the nerves; and no exposition of the functions of this system has yet appeared, which has not been based on one or other of these hypotheses, or on some modification or combination of them. All seem to have forgotten that years of patient toil and investigation must accumulate many indisputable and well-asserted facts, before man can take it upon him to explain the hidden functions of the brain and nerves, if, indeed, human industry and ingenuity be destined ever to achieve such a triumph.

The varying results of the researches of Haller, Le Gallois, Dr Wilson Philip, Dr Hastings, Mr Houston, &c. and the contradictory conclusions deduced from the same experiments and observations by different writers, sufficiently attest the difficulties attending the investigation of this obscure branch of physiology. Flourens, Bell, and Magendie, have confined themselves to the consideration of individual points; and most physiologists of the present day have contented themselves with corroborating, modifying, or extending, the views of these talented writers, thereby tacitly admitting that our present knowledge is not yet sufficiently accurate or extensive to permit the formation of a theory capable of explaining all the phenomena of the nervous system. In these circumstances, we were not a little surprised at the appearance of a work bearing the brief but imposing title of "*a New Exposition of the Functions of the Nerves.*"

This treatise, the first part only of which has appeared, consists essentially, so far as it goes, of two parts blended together,—a critical examination of Dr Wilson Philip's work on the vital functions, and an exposition of Mr Earle's own views. Why the author should have selected Dr Wilson Philip's work in preference to all others, militating against his views for the display of his critical powers, it is difficult to imagine; and, as the merits and defects of that treatise have been long ago sufficiently discussed, we shall not say more of this portion than that it is by far the best part of the volume, and is creditable to Mr Earle's talents and ingenuity. Of the author's own views we proceed to give a brief sketch.

Mr Earle divides the nerves into four classes. The *first* comprehends the olfactory, optic, and auditory nerves, the filaments of which are not intermingled with those of any other. They are particularly connected with the intellect, and their function is most simple, being merely to transmit impressions from their extremities to the brain. The *second* consists of the nerves belonging to the anterior columns of the spinal marrow, by means of which muscles are subjected to the influence of volition. The *third* class comprehends the nerves belonging to the posteror columns of the spinal marrow, by which impressions are transmitted to the brain. The *fourth* class includes every nerve proceeding from the sympathetic ganglions. By these a power independent of the will is communicated to certain parts. To this class, also, he refers the spinal accessory nerves, for a reason to be mentioned hereafter.

These classes are distributed in four different orders. The first class, or the purely cerebral nerves, being the most simple in their arrangement, and forming no connection with the filaments of any other nerve, constitutes the *first* order or distribution. The next most simple arrangement is formed by the union of anterior and posterior filaments, or second and third classes of Mr Earle. This constitutes the *second* order. The *third* order is composed of nerves formed by a union of the posterior filaments with those belonging to sympathetic ganglions, or of the third and fourth classes. All parts supplied by this order are independent of the will. Those nerves which exhibit the most complicated structure, being formed by the union of anterior, posterior, and sympathetic filaments, or second, third, and fourth classes, constitute the *fourth* order. All parts supplied by the last two orders have the power of supporting constant motion without fatigue; but they differ in this respect from each other, that those supplied by the third order are never influenced by the will, while those supplied by the fourth are subject to volition. The first order consists of single, the second and third of double, and the fourth of triple nerves, the posterior filaments being common to all but the first, because, whatever difference there may be in the motion required in different parts, the influence of the posterior nerves is necessary for the maintenance of the healthy state of all the various tissues. The spinal accessory nerves are referred to the fourth class and fourth order, because it is by them that the *trapezii* and mastoid muscles are enabled to assist in supporting the head so long without fatigue, while, at the same time, they are obedient to the will. This is owing to their forming communications with some branches of the spinal nerves, analogous to that of the phrenic with the branches from the inferior cervical sympathetic ganglion, the effect of which will be presently explained.

Mr Earle maintains that there is but one power on which every function necessary for the maintenance of life depends,—that all the various phenomena of life result from different modes of application of this one power, which resides in the brain, and by means of which is secreted by the brain a peculiar fluid, analogous to, though not identical with, electricity,—that this fluid or emanation proceeds from the brain along the anterior nerves, and is returned by the posterior, by the ganglions of which a portion is intercepted and conveyed to the sympathetic, while what remains is transmitted to the *cerebellum*, first supplying, through the medium of the spinal accessory nerves, the *trapezii* and mastoid muscles, thus exhibiting as perfect a circulation of the nervous fluid as of the blood.

Mr Earle farther maintains that voluntary muscles are subject to volition, because, being supplied by nerves of the second order, the influence of the will is applied to these organs; but that, it being impossible that this influence should extend beyond the extremities of those nerves, all parts supplied by nerves of the third order must be independent of volition, while the power of motion is supplied in an uninterrupted stream;—that parts supplied by the second order of nerves are easily fatigued, while those supplied by the third and fourth are unfatigued by the motions of a lifetime, because to the latter is distributed a much larger portion of the nervous fluid than to the former, because fatigue is the result of the exercise of volition. Lastly, that the natural state of those parts supplied with nerves of the second order is rest, and hence the necessity of the stimulus of the will to call them into motion, while the natural state of parts supplied with nerves of the fourth order is motion, and requires the exercise of the will to produce rest; hence fatigue soon ensues from the exercise of the one and the rest of the other, clearly showing that it is the exertion of volition changing their usual state which causes fatigue.

We have here given a rapid sketch of the author's views. Our limits will not permit us to examine his reasoning in support of them, which it would be next to impossible to condense. Ingenious though the hypothesis be, and supported with no ordinary talent, we conceive it to be not a whit better than the extravagant notion of the generation of animal spirits with which the scholastic physicians and metaphysicians of less enlightened ages amused themselves, and to which it bears a strong resemblance, being equally imaginary, and equally destitute of the smallest possible claim to probability.

We regret to see such ingenuity and acuteness as Mr Earle has displayed in the course of the volume now under consideration, bestowed in such a manner; but it is agreeable to the daring spirit of the young enthusiastic physiologist to attempt the solution of questions, and to grapple with difficulties which the older votaries of the science know by their own experience to be placed on the verge, if not beyond the bounds, of human intellect. May we hope soon to see Mr Earle's investigation of some subject more useful and tangible, by the judicious treatment of which he may have the chance of earning something more than merely ephemeral celebrity.

Art. IV.—1. *First Report of the Central Board of His Majesty's Commissioners appointed to collect information in the Manufacturing Districts, as to the Employment of Children in Factories, &c. with the Minutes of Evidence, &c. &c. &c.*

2. *Second Report of the Central Board, &c. &c. Ordered to be printed 12th August* 1833.

THESE ponderous volumes, containing upwards of 1200 folio pages of important information regarding the moral and physical condition of a great body of the operatives in the manufacturing districts of the kingdom, we have carefully perused; and we have no hesitation in saying, that a more impartial, clear, and satisfactory report, has never been laid before the public. It required no ordinary degree of firmness and delicacy to conduct the necessary inquiries, regarding a subject on which such excitement prevailed, in such a manner as to satisfy both parties that even-handed justice was dealt out to them, and at the same time to collect the mass of evidence on which the Commissioners have founded their reports. Of the contents of these reports, it is our intention to lay a condensed view before the reader; but before proceeding farther, it may not be amiss to detail the principal circumstances which led to the appointment of the Commission.

As soon as machinery was generally applied to the manufacture of articles from flax, cotton, and wool, it became obvious, that much of the work which required attention rather than labour might be perfectly well executed by women and children. Many were thus employed who would otherwise have been idle, in consequence of machinery having monopolized the work which had formerly been executed in small portions round the cottage hearths of the manufacturing hamlets. The employment then of women and children was at first a decided blessing to the class employed. The wages earned by the mother and children, united with the gains of the father, enabled them all to fare better, and dress more comfortably, than they could have done under the old system. The hours of labour were few compared with what they afterwards became,—the confinement was more than counterbalanced by shelter from the weather, and the better fare in which they were enabled to indulge, while the parents were not yet so far debased as to starve their children, and apply the proceeds of their labour to the gratification of their own brutal propensities.

Things, however, did not long continue thus. New competitors appeared to divide the gains of the first adventurers, and the necessary consequence was the reduction of both wages and profits. There was a limit, however, beyond which the former could not be reduced; and, in these circumstances, to keep up the latter, more work was gradually demanded from the operatives, till it became absolutely oppressive. Nor was this all. The labour, oppressive as it was, was rendered still more so by its being very unequally distributed over time. The general peace which succeeded the capture of Napoleon, opened to manufacturing and commercial enterprize new fields of adventure. No sooner was there a demand in any part of the world for any description of manufacture, than expresses were sent to the manufacturers, who vied with each other in the rapidity with which the article required was produced. Then did the factory system exhibit all its horrors. The demand for children to do the lighter work was increased; and unprincipled parents were induced, by the temptation of the wages offered, to sell their children into bondage, and to sacrifice their moral and physical constitution. Children of an age at which those of the middling and upper classes of society are not permitted even to cross a street, except under the superintendence of some one who can be trusted, were kept for thirty and thirty-six hours without intermission, engaged in a monotonous employment, which of itself would have induced sleep, even though nature had not been taxed beyond her powers. What then kept the wretched beings awake? Tales of obscenity and ribald jests; and when these were insufficient, and the drowsy god was shedding his influence over them, the spell was soon broken by the instantaneous application of the strap, the *billy-roller*, the fist, or the foot, to the person of the votary; and many were the victims maimed or killed by coming in contact with the machinery, when exhaustion of their sensorial powers prevented them from taking care of themselves. The petty tyranny, too, exercised over the children by those very workmen who were afterwards so loud in their demand for justice to outraged humanity, formed not the smallest portion of the misery of the ill-fated factory children. The record of their wrongs is not yet completed. Had they, ere their return from this scene of suffering, been received with kindness in their wretched hovels, houses they cannot be called, there might have been some intervals during which they were free from the cruelty of their oppressor.

But what shall we say of those parents who could rob their children of all their gains, and, while they locked them up with a scanty allowance of loathsome food, adjourned to the tavern, to spend in disgusting debauchery the pittance obtained by the moral and physical degradation of their offspring! On these scenes of wretchedness we shall no longer dwell. But were it the province of this Journal to advocate the cause of the oppressed, and to call down on the heads of the oppressors the curses of their fellow-men, we could unfold tales of the sufferings of the infants sold into bondage by their reckless parents, or hired out by those to whose cold charity is committed the orphan, and he who finds less sympathy in the feelings of men, the bastard,—tales of cruelty and oppression, which, for the honour of humanity, we would hope, have seldom been paralleled among civilized nations, and of which, we trust, that hereafter it will be impossible to find an example.

It must not be supposed, however, that the legislature stood callously by and permitted this system to go on uninquired into and unchecked. Committees of Parliament were appointed to inquire into the grievances and their remedy; and, previous to the bill passed last session, no less than three enactments, we believe, were made for the protection of the children employed in the factories. The picture of the moral and physical degradation of these children and their parents exhibited to the committee appointed to inquire into the subject, beggars description. Those who desire to see how far human nature can be brutalized, even in the midst of a nation justly proud of its civilization and intellectual superiority, will have their curiosity amply gratified by a perusal of the reports of these committees. The legislative enactments, though they failed completely to eradicate the evil, had still some beneficial effect; for we find that the condition of the factory workers, especially in the larger establishments, has of late years been considerably improved.

The cry against the oppressor, however, continued to be loud and importunate. In 1832, a committee of the House of Commons heard evidence regarding the state of the junior operatives, when numerous instances of the most cold-blooded barbarous treatment were detailed. Many of these were afterwards proved to be gross exaggerations; but they were eagerly laid hold of by that portion of the press which delights in ministering to the stronger passions of the community. Comments of the most inflammatory description were weekly and daily published. The owners of factories were denounced as unfeeling monsters, warring against humanity, and gratifying their avarice at the expence of the sufferings, the ill health, and the death of the miserable children hired out to them by their parents or the parish authorities. The manufacturers, conscious that, though some of their number might not be scrupulous regarding the means by which the work of their mills were expedited, they, as a body, were unjustly branded with inhumanity, prayed the House of Commons to take steps to ascertain the truth. It appeared that a committee of the House was not the most eligible body for collecting evidence, inasmuch as it could not administer an oath to the witnesses,—without which there was no security against falsehood, or at least exaggeration; and, moreover, the distance from the factories was so great in some cases as to have a tendency to prevent much valuable evidence from being adduced. In these circumstances, the House of

Commons presented an address to the King, praying that a Royal Commission might be appointed to collect evidence throughout the kingdom as to the real state of the factory system. Accordingly, His Majesty issued a Commission, dated the 19th April last, conferring on certain individuals,—some of whom were medical men,—full powers for collecting the necessary information; and so expeditiously was the task accomplished, that the first report was furnished by the 25th of June,—the second by the 13th of July,—and both reports and evidence were ordered to be printed on the 12th of August, or less than four months from the issuing of the Commission.

We now proceed to the task of condensing the information contained in the reports and evidence before us, earnestly entreating the reader to dismiss from his mind, as we have from ours, all prepossessions, and more especially such as may be traced to the exaggerated views given in the party journals of the day. It is much to be regretted that politics are more or less mingled with almost every thing; and he who searches for truth will with difficulty find it, warped as it is by the views and interests of the different factions of the state, the different sects of political economists, and of the parties whose interests are at stake. The owners of factories and their partisans represented them as regulated in the best possible manner; the operatives maintained the very reverse. The one class called loudly for protection, while the others asserted that no protection was necessary. Then the two sects of political economists took up the question,—the one advocating the principles of free trade in labour as well as everything else, while the other held it to be the bounden duty of a state to interfere for the protection of the rights of those who were unable to protect themselves. Exaggerated and distorted statements were made on both sides. But in this, as in most cases, truth lay between; and we find that factories are not yet the paradises they are represented to be by their owners, nor now-a-days, in all cases, the pandemoniums depicted by the operatives. The open and impartial manner in which the evidence was taken by the Royal Commissioners, and the labour bestowed on their reports, are highly creditable to those honoured with the task. In this article, therefore, we shall confine ourselves to the record of their labours, carefully avoiding all allusions to reports contained in the ephemeral publications of one party or the other.

The Commissioners were directed to collect information "as to the employment of children in factories—as to the effects of such employment, both with regard to their morals and their bodily health—as to the propriety of curtailing the hours of their labour—in what respect the laws made for the protection of such children have been found insufficient for such purpose—

and what may be the farther provisions necessary for their protection." Instead of following the Commissioners through these details, we shall condense the information under two sections:—1*st*, The actual state of the factories when examined by the commissioners; and, 2*d*, The effects of the employment and habits thereby engendered on the operatives and their offspring,—concluding with an inquiry how far the provisions of the law now in force are calculated to prevent the evils hitherto existing, and better for the future the condition of the junior operatives.

1*st*. *The state of the factories when visited by the Commissioners.*—For the purpose of expediting inquiries on this branch of the subject, "four districts were traced out, comprehending the seats of each of the principal branches of manufacture in which any large proportion of infant labour is employed." In this branch of the subject, however, we shall throw together the information obtained from all the districts, directing our attention to the hours of labour, and the time allotted to meals,—to the age of the operatives,—nature of the employment,—state of the buildings,—and treatment by the masters and overseers,—and to the wages, food, clothing, and mental cultivation of the operatives.

In Scotland, the duration of the labour is generally from twelve to twelve hours and a-half daily; in some few instances it does not exceed ten or eleven; in other still rarer cases it is not less than thirteen. In some instances the hours of labour are one or two less on Saturdays, but this, as well as the time lost by holidays, is made up by extra work on other days. The general allowance for meals is half an hour for breakfast, and half an hour for dinner. Instances occur where three-quarters of an hour is allowed for each meal, and, in some rare cases, an hour. The children remain for half an hour after the mill stops, to clean the rooms and machinery.

In England, the number of hours varies in different districts from eleven to fourteen, but in general it does not exceed twelve This is to be understood as the average space, as there are occasional irregularities, caused partly by the dissipation of the carpet weaver, who is forced to make up the time he has lost,—partly by the delay occasioned by dyeing,—and, in the clothing factories, by the irregular supply of water. In some factories the work goes on night and day, being managed by two shifts of twelve hours, or three of eight hours each. The time allotted to meals varies considerably. In some factories there is an allowance of one hour for breakfast, the same for dinner, and half an hour for tea; in others there is only a quarter of an hour for breakfast, and half an hour for dinner. Sometimes only one hour, or even half an hour, for dinner, is all that is allowed during the day; and in some few instances, especially during a press of work, the operatives devour their meals during their labour, as they can find an opportunity.

In Ireland, the working hours vary from twelve and a-half to thirteen and a-half daily, except on Saturday, when they are only nine and a-half, or ten. The time allowed for meals is three-quarters of an hour for breakfast, and the same for dinner.

In Scotland, the age of the operatives varies from seven to twenty-four and upwards. The majority are girls. Ten or eleven, however, seems to be the usual age at which they are now admitted. The nature of the employment varies according to the manufactory. In the cotton, flax, and woollen mills, the processes are *preparing*, *roving*, *spinning*, *reeling*, *&c.*

Preparing, generally done by boys, consists in passing the raw material through machines called teazers, carding-engines, preparing-frames, &c. This process occasions the disengagement of a very considerable quantity of the lighter portions of the cotton, flax, &c. by which the atmosphere becomes clouded and tainted to such a degree, as to threaten suffocation to any one accustomed to purer air, and to affect those exposed to it for any length of time, with hoarseness, cough, expectoration, and other diseases incident to the respiratory organs. The temperature, though lower than in the spinning-rooms, is yet much too high.

It may be right to mention here, that one of the processes connected with the preparing of flax consists of *heckling*, which has been performed by boys since the application of machinery to this part of the work. The age of these boys varies from seven to twelve, and their duty is to insert the flax, previously *roughed*, into certain machines technically called *devils*, which are cylinders or drums with fine teeth, driven with such velocity as to perform upwards of three hundred revolutions in a minute. Accidents frequently occur from these machines, but seldom exceeding the loss of a finger. The atmosphere of the rooms devoted to this part of the process is so impregnated with dust and other floating bodies, that one-half of the workers in a room fifty feet long are generally invisible.

Roving is generally managed by girls. The temperature of the apartments used for this purpose is much the same as that of those already noticed, and the atmosphere is similarly contaminated.

Spinning, reeling, &c. are altogether performed by girls in apartments, of which the temperature, especially in cotton-mills, as appears from the evidence, averages fully 86° F.; while in many instances, in consequence of the ventilators being shut, and the steam kept on during the temporary absence of the workers, it continues for hours after their return many degrees higher.

Since the introduction of *wet-spinning*,—a process by which the quality of the yarn is much improved,—the fatigue and exhaustion of the girls employed in this department of the manufacture has increased a hundred fold, from their being obliged to stand in the coldest day of winter, for twelve or fourteen hours, wet from the waist downwards. It is stated in evidence, that the operatives were furnished with oil-skin aprons, and other protections against the wet. It turns out, however, that these and other articles, such as wooden shoes, are paid for by the girls themselves, and, after all, are found to be of little or no use.

Passing over the bleaching, we come to the power-loom weaving. In this department, a very great number of children is employed, under the control of the elder girls. Their duty is merely to attend to the threads of the warp and woof, and to tie them when they break. The noise of these works is perfectly deafening; and the temperature generally at 90°, frequently exceeds 110°, F. on account of great heat being necessary for the sizing of the webs. As in many of the power-loom factories the elder girls are paid by the work done, their treatment of the children under them is often unmerciful, especially when, through any negligence of theirs, they run the risk of being fined, which they are severely, on the discovery of any flaw in the web.

Regarding the buildings, we think it only necessary to state, that those recently constructed are large, handsome, well-ventilated, and furnished with every convenience for the different sexes, while the old factories are small, damp, ill-ventilated, surrounded by nuisances of every description, and affording little or no accommodation.

Viewing the factories of Scotland in the gross, truth compels us to state that the operatives in them are worse used than any other class of labourers. We do not pretend to assert, that a number of boys, trained as the children of the factories generally are, can be managed without the occasional infliction of corporal punishment, which, under due regulations, we have no hesitation in saying, is preferable to the system of fining; but we decidedly object to their being placed at the mercy of every petty tyrant of an overseer, who, with all the insolence of upstart authority, conceives his own consequence to be enhanced by the amount of misery he can inflict on his helpless dependents. We are happy to see it stated in the evidence, that, in the larger mills, the proprietors and managers have, in the spirit of philanthropy and enlightened policy, prohibited every description of violence towards the workers,—trusting rather to the affections or self-interest of the operatives, than to the harshness of their overseers.

This policy stands in bright contrast to the conduct of the proprietors and managers of several of the smaller factories,—

men who, themselves rising from the dregs of the people, ought to have more mercy on the class which they have so recently quitted. It would be harassing both to our own feelings, and those of the reader, to detail the various instances of harshness and cruelty, narrated in the evidence before us. We shall content ourselves, therefore, with quoting the opinion of Mr Stuart, one of the Royal Commissioners, regarding Mr Gilchrist's mill at Bervie, in Kincardineshire,—a censure which, we are sorry to say, is but too applicable to many others. "It seemed more to resemble a receptacle of demons, than the work-house of industrious human beings.* * * The appearance and language of the workers, both men and women, proved the state of demoralisation which exists here. * * * Those engaged in vicious courses, to whom the regularity and excellent regulation, in many respects, of the Montrose establishments, would of course be irksome, doubtless find a fit asylum here; but it was painful to find in the bothy, the eating and sleeping-room of such a nest of profligates, two or three young females without a parent or relation there, or in the neighbourhood, to look after their conduct, or to make any attempt to rescue them." Speaking of another mill of the same description, Mr Stuart says, "the apartments in the spinning-mills are, as it appeared to me, the dirtiest and most low-roofed we have yet seen; several of them very damp; windows so constructed, that they cannot be opened; and the smell of whale-oil and tar very disagreeable. I complained to Mr Wilson Junior of the bad air and smell, as being to me almost intolerable; but he treated my opinion very lightly, telling me that the smell of oil was peculiarly healthful, and that he preferred it to that of the carnation."

It is unnecessary to follow in detail all the processes of the English factories. Suffice it to say, that the principals are something similar to those already mentioned, *mutatis mutandis*, and that the junior operatives are in general worse treated than those of Scotland. They consist commonly of the children of the most dissipated of the lower orders, of orphans and bastards hired out by the overseers of the poor. Their food and clothing both are wretched in the extreme. All the bonds of affection seem to be rent asunder,—the parents oppressing and defrauding the children as long as they can, and the children leaving their parents when they become knowing enough to comprehend the value of money. The age at which they are sent out to work is considerably lower than is to be found in Scotland. They are completely under the control of the workmen whom they assist, and who, when, from dissipation, stoppage of the machinery, &c. lost time is to be made up, scruple not to keep the children at work all night, by the powerful stimulus of personal suffering. We here speak of the majority,—for there are instances, and these, we are happy to say, not few in number, where the proprietors and managers act on enlightened and benevolent principles, and there the situation of the operatives is highly comfortable.

In Scotland, the wages of a girl of fifteen years of age, and upwards, vary from 5s. 1d. to 8s. a week, 5s. 6d. or 6s. being the usual sum. For extra time they are paid a mere pittance, never amounting to a penny an hour, and they are paid this only when it is really extra time, not when they are working to make up time lost by stoppage of machinery, holidays, &c. The wages of a child of ten or eleven vary from 2s. to 3s. 6d. a week. A small sum is deducted in many cases for payment of the medical attendant, and sometimes twopence and upwards a week is retained by the employer till the end of the engagement, which is forfeited should the operative either leave the work spontaneously or be dismissed, which, from whatever cause arising, is pretty frequently the case. There is a system of fining to compel attendance and attention to the work. The fines appear to us to be very exorbitant. Should a girl be ten minutes too late, she is fined sixpence, and loses all her wages to the next bell ringing. This is surely unnecessarily severe, seeing the same girl for an hour's work will not earn a penny. The food is the same as that used by the lower orders of the country. For breakfast, oatmeal porridge and milk, sometimes merely brose.* Some of them have tea or coffee, with bread and butter; but these are rare cases. The dinner consists sometimes of broth made with a bit of mutton, more frequently of potatoes and herrings. Of supper little mention is made. We may infer, however, that such a thing exists, from the children complaining of their being unable to eat any thing on their leaving work at night,—a state of things of which the female operatives also complain. The clothing is wretched in the extreme, barely enough to cover their nakedness, sometimes scarcely even that; and we believe, both from what is stated in the evidence, and from what has come to our own knowledge, that girls who possess better clothing generally purchase it with the wages of prostitution.

To some factories Sunday schools are attached, and the children are taken regularly thither, and to church. Some of the larger factories built of late by wealthy capitalists have schools attached to them for the instruction of the children in the more common branches of knowledge. Taking, however, a general view of the whole system, as exhibited in the evidence, we are compelled to state that the moral and intellectual faculties of the children and the female workers are on the lowest possible scale. This is especially the case in the smaller factories, the state of the inmates of which is such that it would be difficult, among the prostitutes of a great city, to find individuals whose language, ideas, and customs, are more abandoned and loathsome. Even the children lisp these obscene jests, and discuss with a fiendish precocity subjects in a style worthy of the experienced debauchee.

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* For the benefit of the English reader, we may mention that this consists of oatmeal reduced to the consistence of a rough paste, by pouring boiling water on it. It is not boiled, and is thus both less agreeable and less digestible than oatmeal gruel.

We have now done with the first branch of our inquiry—the state of the factories at the time of the visits of the Royal Commissioners; and from the brief view which we have given, the reader, we hope, will concur with us in the following conclusions:—That the children employed in all the principal branches of manufacture throughout the kingdom work during the same number of hours as adults,—that a vast deal of suffering is still inflicted on the children,—that this takes place chiefly in the small factories,—that a great proportion of the severity and cruelty towards the children is inflicted by the workers themselves,—and that, in the larger manufactories, all violence is not only discountenanced, but strictly prohibited,—that, at the age when children are exposed to such hardships as we have detailed, they are not free agents, and their gains are appropriated by their parents and guardians,—that the worst specimens of the factory system are found in those small old mills belonging to men of limited capital and limited education, while the newly erected mills, in the possession of wealthy capitalists, have little or nothing objectionable about them,—that the excessive fatigue is such as to prevent all mental cultivation,—and that the congregation of numbers of such uncultivated beings must give rise to disgusting conversation, abandoned habits, and vicious acts.

We now proceed to state,

2*d*, *The effects of the employment, and habits thereby engendered, on the operatives and their offspring.*—These are immediate and remote. The more immediate are fatigue, drowsiness, and pain; the remote are constitutional debility, deformity, local and general diseases,—deficient intellectual and moral culture. To each of these, except the last, we shall direct our attention,—the effects of the system on the morals and intellect having been already discussed.

It is stated in evidence by the children, their parents, the overseers, and the owners themselves, that the fatigue is so great that the children frequently endeavour to hide themselves to save the additional labour of walking home,—that, on the return of the children and the female workers to their respective habitations, they are incapable, from sheer fatigue, of taking any sustenance, and often spend a sleepless night uttering expressions of pain,—that the children, roused early in the morning, before they have recovered from the effects of the preceding day's labour, repair to their work almost in a state of stupefaction, and continue drowsy for a considerable time,—that pains in the limbs, back, loins, and sides, are pretty frequent occurrences, but chiefly among those who have been sent at an early age to the factories,—that the girls suffer more frequently, and for a longer period, than the boys,—and that the pain in the feet of the children from long-continued standing is frequently so acute as to cause them to throw off their shoes, and catch cold.

Can any man of common sense, who reflects on this incessant labour, daily fatigue, the want of sleep, the scanty clothing, the meagre fare, and the impure atmosphere inhaled, for a moment hesitate in declaring that such evils must prove powerful predisposing causes to various distempers, and that it is next to impossible to escape disease? It is a most wonderful thing, in the face of all this, to find many medical men *attached to factories* asserting the superior healthfulness of these establishments. We grant that in some cases, such as the large, well-aired, recently constructed factories, this holds good. But it surely looks like endeavouring to make the best of a bad case when comparisons are instituted between the factories and collieries in favour of the former. We have always understood that colliers, though earning high wages, were a dissipated, reckless, miserable set of beings; and to compare the health of any class of workers with theirs, is, to say the least of it, to adopt a very low hygienic standard. We are ready to admit, that in large well-ventilated factories, where the hours of labour are kept within bounds, and a sufficient quantity of sleep is in the power of every one, the operatives may enjoy as good, if not better, health than other classes of labourers. But those so situate amount to a mere fraction; and, in estimating the effects of the system, we must look to the general results, not to individual favourable cases. Judging, then, in this way, it would appear, from the evidence of the Commissioners, that those who have commenced factory labour at an early age have an unhealthy look, and are liable to all the diseases resulting from a debilitated constitution; that the children are stunted in their growth; and that among the females, the appearance of the menses is retarded till the eighteenth or nineteenth year, and chlorosis frequently occurs. A decided difference in the appearance and health is observable between the operatives engaged in the factories situate in the country and those living in large towns. This may be attributed both to the country air and food, and to the mills being generally recently built, and consequently much better constructed and ventilated.

Fewer instances of deformity occur than might have been expected. Some few cases of curvature of the spine are mentioned; but distorted *pelves* seem to be very rare.

Of local and constitutional diseases we have a formidable list. From long standing result sore feet, swelling of the legs in females, varicose ulcers, weakness and disease of the knee-joints. The impure atmosphere, the high temperature of the factories, and the damp from the wet-spinning frames, give rise to hoarseness, which is very prevalent among the females, asthma, cough, expectoration, consumption. The last is very common. From fatigue, irregularity of meals, arise all the forms of dyspepsia, headach, &c. Those engaged in wet-spinning are peculiarly liable to coughs, expectorations, headachs, and all the diseases consequent upon suppressed or painful menstruation.

We have run rapidly over this frightful catalogue of diseases; and this part of the article might have been extended to a considerable length, by detailing individual cases, and quoting from the evidence. This, however, would have led us to the invidious task of discussing the conflicting testimonies, and exposing the illogical deductions of several of the medical witnesses, not a few of whom, we cannot help remarking, seem to have been actuated with a desire to represent every thing connected with the factories in, what impartial judges would consider, a too favourable light, and to have shut their eyes obstinately against truths which forced themselves on the attention of the Commissioners.

To render this account of the factory system complete, we shall conclude this article with a summary of the provisions of the Act passed last session of Parliament for their regulation.

As the law now stands, no one under eighteen years of age can be employed during the night, which is defined to be between half-past eight P. M. and half-past five A. M. No child under nine years of age is to be admitted to work on any conditions. The labour of children from nine to thirteen is not to exceed eight hours a-day, or forty-eight per week—that of those from thirteen to eighteen not to exceed twelve hours a-day, or sixty-nine hours per week, exclusive of an hour and a-half for meals. Two holidays and eight half holidays are to be given in the year, the latter to be regulated by the master. To prove the age of the child, the certificate of a surgeon, that the child is of the usual strength and appearance of children of that age, is to be admitted as evidence. Four inspectors are to be appointed, who are to have the authority of magistrates. Every child between nine and thirteen is to attend a school, to be chosen by the parents or guardians, for the space of two hours daily at least, and to bring to the factory every Monday morning a schoolmaster's voucher to that effect. The inspectors have power to provide schools where necessary. The fee to be one-twelfth of the child's earnings.

These regulations, unless evaded, seem calculated to deprive the factory system of most of its horrors, and to secure, as far as lies with the Legislature, that degree of mental culture which is suitable to the station in society of the objects of it. It may perhaps be said, that even by this bill the employment of children of too tender an age is sanctioned. This is our own opinion; but, taking into consideration what would probably be the fate of these children if denied the means of earning their subsistence, and securing their education, we are induced to look upon this clause in an indulgent manner, and to hope the best. We trust that hereafter the page of the history of the manufactures of this country will be unstained by any of those foul and discreditable narratives which have hitherto caused manufacturing enterprise to be associated with scenes of degradation and misery, and which exposed to the execration of the lower orders those individuals to whose ingenuity and capital they were indebted for their subsistence.

ART. V.—*A Treatise on those Disorders of the Brain and Nervous System which are usually considered and called Mental.* By DAVID UWINS, M. D. 8vo. London, 1833. Pp. 235.

OF the work before us, it is impossible to speak in terms either of commendation or censure, since it is one of those common-place treatises in which the medical literature of the age abounds. For those entering on the study of insanity, it is by no means calculated; and to those conversant with the literature of this branch of the healing art, it will hardly be of any use; though to a third class, who, somewhat acquainted with the subject, may wish to know how far the opinions of others accord with their own, it may perhaps prove interesting. Of the disputed points in the diagnosis and treatment of insanity, we find no very satisfactory discussion, and we look in vain for enlarged views of the reciprocal influence of mind and matter.

Of a volume of this description, it would be useless to give a detailed account. We may mention, however, that it contains discussions on several classifications and definitions of insanity, its sources, symptoms, prevention and treatment, besides at the end, a recapitulation of the whole, which really contains all the valuable matter in the book.

The author is a demi-phrenologist, disputing no doubt, several of the dogmata of the sect, but, upon the whole, favourable to their opinions. He maintains that the difference between sanity and acknowledged insanity consists rather in degree than in kind,—that nervousness is in reality but a milder species of insanity,—that "the nosological distinctions of systematic authors are not only arbitrary and conventional, but positively fallacious and absurd, when made to designate diseases something abstract and specific,"—that "derangement is a circumstantial, a relative affair; so that the classification of *mania*, *melancholia*, *hypochondriasis*, &c. are *(is?)* founded in *(on?)* entire misconception of the very nature of disordered essence,"—that phrenology may be applied to the prevention of mental aberration, as it demonstrates "the points of attack, and the mode in which the attack may succeed when there is a constitutional or organic bias to go wrong,—that the principles of phrenology "may be considered established when they show, which it seems they do, that altered form of brain as indicated by exterior marks, bears a relation, both in quantity and locality, to the exercise of this or that faculty, or of the indulgence of this or that propensity. The intellectual and moral aspirant, by working his intellectual and moral faculties, brings out the form of his skull in those parts where it is delightful to witness its increment; the sensualist does the same thing for the animal portion of the brain and its investments."

These views, though by no means new, we must be permitted to say, are not in accordance with those of the ablest physiologists. Had Dr Uwins confined himself to the enunciation of the simple proposition, that, as during life, the mind acts and receives all impressions through the medium of a certain portion or portions of the body, and that whenever the organization of one or all of these parts, or of any intimately connected with them, is at all disordered, the acts and perceptions of the mind must be proportionally deranged, he would have expressed an opinion which might be supported by a reference to various cases, and many well established facts in pathology. But when he goes beyond this, and affirms that the influence of the mind can modify the form of the different parts of the brain, and likewise of the skull, it appears to us much of a piece with asserting, that the eye can modify the convexity or concavity of the lens which is applied to it to aid the sight. It is besides contrary to the opinion of the ablest physiologists, to suppose that the brain is altered in size after the age of puberty, however it may increase in density. If, indeed, we may believe the Wenzels, the brain does not increase in size after the seventh year.

Dr Uwins enumerates among the causes of insanity, "that kind of debility in the brain and nerves, which semi-learning and false refinement, and querulous habits occasion," vapid articles of diet, spirit-drinking, and false notions of religion.

We agree with the author in thinking "that mad-houses ought to be divested of their *peculiar* character, and considered only as hospitals," for those bodily ailments preventing the proper exercise of the mind. But we suspect that many other vulgar prejudices must be eradicated ere we can hope that the great body of mankind will cease to look upon receptacles of lunatics and their inmates with any thing less than strong aversion.

We shall conclude this brief notice by observing, that the present work, considering the quantity and quality of the information which it contains, would have figured better as a memoir in some journal, than as a formal treatise. From the claims which Dr Uwins advances to experience in the treatment of the insane, we should suppose that he has it in his power to give to the world the details of many interesting cases. A judicious selection of these, with clinical observations, would, we imagine, be more conducive to the edification of his professional brethren, and the advancement of his own reputation, than the bare narrative of his opinions, whatever claims to accuracy and originality they may possess.

ART. VI.—*A Memoir on the Advantages and Practicability of Dividing the Stricture in Strangulated Hernia on the outside of the Sac; with Cases and Drawings.* By C. ASTON KEY, Senior Surgeon to Guy's Hospital, and Lecturer on Surgery. London, 1833. 8vo. Pp. 161.

IT is certainly a remarkable fact, which has attracted the attention of all practical surgeons, that, though the pathology of *hernia* has been most successfully explored, still operations for its removal have not been attended with the degree of success which might have been anticipated. The unfavourable termination, indeed, of cases of *hernia*, notwithstanding the appropriate operation for relieving stricture, is so frequent, that, though death is certain when the stricture is not relieved, the surgeon can never be assured that he can avert the fatal termination by operating, and replacing the protruded bowel.

Various causes, doubtless, unconnected with the operation contribute to this result; and Mr Key has, with the knowledge and sagacity of an experienced hospital surgeon, adverted to the principal of these causes. One of the most obvious, evidently, is the late period at which the operation is performed,—in other words, the circumstance, that the stricture has produced upon the affected part of the intestinal tube a degree of disorganization from which it cannot recover; and that, although the cause is removed, it is physiologically impossible to remove or counteract its injurious effects.

This, however, Mr Key infers, is not the principal cause of the fatality of these operations; and he informs his readers, that he has recently witnessed a series of operations for *hernia*, in which every thing that mature judgment could suggest, and great skill could accomplish, was effected, and in which the previous condition of the patients afforded the most just expectations of recovery after the replacement of the protruded parts;—yet in all of which, the insidious supervention of peritoneal inflammation within a few days enfeebled the strength of the patient beyond the possibility of recovery.

It appears further, from the experience of Mr Key, that operations for cases of *hernia* are more frequently followed by the fatal termination in hospital than in private practice. This he ascribes partly to the delays necessarily occasioned in the practice of hospitals; and, if this inference be well founded, it is obvious, that the most prompt measures ought to be adopted to diminish as much as may be practicable, if not to remove altogether, every similar cause of unfavourable result. Strangulated *hernia* is a disease which proceeds so rapidly to an irrecoverable state of the protruded parts, that the most prompt measures are ofttimes too tardy to arrest the fatal tendency of the disease.

Of all this fatality, Mr Key conceives the principal cause is exposure or injury of the intestine, or both, and consequent peritoneal inflammation; and, with the view of demonstrating the reality of the existence and influence of this cause, he adduces the leading circumstances, semeiographic and necroscopic, of thirteen fatal cases which have occurred in Guy's Hospital within the last few years.

" The majority of the cases," says Mr Key, " appeared to have died from peritoneal inflammation consequent upon exposure of an inflamed or strangulated portion of bowel. I say *exposure* of the bowel; for it is probably not so much the wound in the peritoneal sac that disposes to inflammation, as placing the bowel under circumstances to which it has hitherto been unaccustomed. The sudden change of temperature to which it is submitted, the exposure to light, and to a current of air, cannot but have some influence upon the delicate circulation of the part, and be productive of some impression on the nerves of so susceptible a surface as that of a strangulated intestine; and if to these influences be added, the handling which the gut usually experiences, the reaction that follows these agents we must regard as a natural consequence, and likely, as experience proves, to amount to excessive inflammation. In tracing the inflammation consequent upon an operation for *hernia*, it is found to spread from that portion of the bowel that has been strangulated over the peritoneal surface of the intestines, and not to have its origin from the incision in the sac, although two wounds are usually inflicted on it; one for the purpose of exposing its contents, and another higher up, to divide the stricture. The *peritoneum*, about the seat of stricture, exhibits fewer signs of acute inflammation than the investment of the bowels."—P. 11-12.

To the latter fact we shall afterwards advert more pointedly. But, in the meantime, we shall confine our attention to the train of investigation pursued by the author.

From the appearances presented by the parts during the operation, and those found after death in the thirteen cases detailed in the present memoir, Mr Key draws the conclusion, that, had the stricture been merely divided without opening the sac, none of them, except two—the 2d and 12th, both instances of gangrene of the intestine—would have been injured, and several of them would have been very materially benefited. In the 4th, 8th, 10th, and 13th cases, in which the intestine is said to have been healthy and natural in appearance at the period of operation, and in which after death albuminous exudation was found on the surface of the *peritoneum*, and sero-purulent effusion in its cavity, Mr Key considers the fatal termination as the result of exposing and handling the bowel; and thinks that it may be fairly presumed, that, if these *herniæ* had been returned without opening the sac, the event would have been different. The other cases, excepting the first, in which the existence of *hernia* was not recognized till the death of the patient, Mr Key thinks, owed their fatal termination chiefly to injudicious perseverance in employing the *taxis*; and the 9th and 11th, he thinks, to the presence of the stricture, and the force used in the *taxis* combined.

From all these facts taken together, and from attentive consideration of the anatomical structure of the parts concerned, Mr Key proposes to revive the method of operating proposed and practised by Petit and the second Dr Monro,—viz. to attempt to relieve the stricture, and replace the protruded intestine without dividing the hernial sac. With the view of demonstrating not only the practicability, but the safety, expediency, and superior advantages, of this method of operating, Mr Key takes a survey of the cases of Dr Monro, published in 1788, in his work on the *Bursæ Mucosæ*, and then enters on a critical examination of some similar cases in which this mode of operation was performed by Sir Astley Cooper, and recommended by Boyer, and advocated by an anonymous author in this Journal in the year 1814. It is unnecessary to follow Mr Key in his examination of these facts, and the evidence which they afford in favour of the operation; and it will be both more interesting, as well as more useful, to see what Mr Key feels himself, from personal observation and experience, justified in advancing in its behalf.

The following passage may be said to exhibit a just view of the particular principles which Mr Key is desirous to impress in regard to the operation.

"I need not again urge the main benefit derived from the external division of the stricture in the non-exposure of the patient to those causes of inflammation to which the ordinary operation subjects him, and, as experience frequently proves, with most unhappy consequences. The exposure of a bowel in a state of incipient or active inflammation,—the handling it in this susceptible state,—the incision made into a peritoneal bag already disposed to, if not in an actual state of, inflammation,—are, as every surgeon will admit, and as his forcible efforts to reduce the *hernia* without the knife prove that he feels them to be dangers of no ordinary magnitude to a patient labouring under a strangulated intestine. I do not feel that I have exaggerated the risk of inflammation; for frequently *enteritis* comes on, when at the time of the operation the bowel appears to be healthy, and the abdomen free from tenderness; and when general inflammation precedes the operation, the release of the intestine by the knife rarely succeeds in checking it."

"Cases are sometimes met with in which the patient appears to be doing well after the operation,—the evacuations being free and natural, and the sickness and pain subsiding; but after the lapse of two or three days the powers begin to sink; the abdomen, though not very tense, is uneasy under pressure; the pulse small and quick; and the tongue becomes dry and coated. This condition is perhaps protracted for several days, and the patient at length dies. A *post mortem* inspection discovers the cause of death in the dark colour and lacerable condition of the strangulated portion of bowel, and the vascular state of the surrounding parts."

"This unexpected termination of a case, when it does occur, usually takes place in patients of enfeebled constitution, whose powers are unequal to the restoration of the healthy circulation in the strangulated bowel after its release from the stricture; and in whom, therefore, a slight degree of inflammation gradually ends in the extinction of its vitality. At the period of the operation, the intestine when exposed presents none of the usual indications of present or approaching gangrene; no infiltration of its tissues,—no discoloration beyond that which retarded circulation in a healthy bowel produces,—no lack of peritoneal lustre,—and no lacerability of texture; it in no point appears to differ from those cases of strangulation in which an early operation is had recourse to before severe symptoms come on, and in which a favourable prognosis is verified by a rapid convalescence. Exposure of a portion of bowel possessing such feeble powers of resistance to morbid influence cannot but tend to increase, probably to excite, a disposition to inflammation; which, though low in degree, is sufficient to destroy its vitality; and it may, therefore, be fairly regarded as the main agent in the production of gangrene."

"In cases in which great depression of the powers are observed to precede the operation, death sometimes rapidly takes place without any other cause than exposure of the bowel. The condition of the patient is often found to be manifestly worse after the operation, and stimulants are obliged to be plentifully administered, in order to sustain the sinking powers of life. This may happen without inflammation of the abdominal cavity, or gangrene of the bowel, and it is attributable solely to the depressing effect of the operation. The pulse, which before the operation was feeble, becomes fluttering and scarcely perceptible; the countenance, which was anxious, now bespeaks the approach of death; the skin is covered with a clammy moisture; and the whole frame is seized with a restlessness that gradually ends in the calmness of dissolution."—Pp. 51–54.

Mr Key further impresses on the surgeon the great danger of handling, especially a large *hernia*, and employing much force, as is not unfrequently done in repeated and long-continued efforts at reduction by means of the *taxis*, and maintains, that, as these forcible and ofttimes violent efforts cannot fail to bruise the portion of intestine protruded, that portion, like other contused tissues, must have a much better chance of recovery if its surface be not exposed than if it were. In the instance of external bruises without wound, Mr Key reminds his readers, the contused parts speedily recover; but in those complicated with wound, however small, sloughing of the cellular tissue, with copious suppuration, is an almost invariable result, and the healing process is tedious. A portion of intestine or *omentum*, much bruised by the *taxis*, Mr Key regards as in precisely the same circumstances, and as urgently requiring the same forbearance and delicacy.

Besides the reasons now urged for attempting reduction without opening the sac, Mr Key considers that, by adopting this method of operating, many of the ordinary accidents, which more or less certainly await all operations for *hernia*, may be obviated. Thus not only are the blood-vessels, in the opinion of Mr Key, placed in less danger of division, but if any of them be divided, the blood would not flow into the abdominal cavity, and thus mislead the surgeon as to its occurrence. This mode of operating is also recommended by the fact, that the intestine is itself more effectually protected from the risk of being wounded by the knife; and, in proof of the actual occurrence of this accident, he refers to the authority of Sir Astley Cooper, and a preparation exhibited by Mr Abernethy. Lastly, Mr Key maintains, that the small collections of purulent matter often found at the neck of the sac on inspection in fatal cases of operation, betoken the existence of an intense degree of inflammation, which he thinks may be justly ascribed to the violence, the handling, and the chilling of the intestinal surface during long exposure to the atmospheric air.

Mr Key next proceeds to consider the objections which have been urged against this mode of operating by Heister, Richter, and others, and shows that they are much less important than has been generally believed. The only one to which he appears to attach much importance is the difficulty of performing it; and this, he justly remarks, ought to form no objection with surgeons who are competent and skilful anatomists. He admits, indeed, that he was somewhat startled by the difficulty of dividing the stricture without opening the sac in inguinal *hernia*, until he had fallen on a method which greatly facilitated the operation; viz. by making in the tendon of the external oblique, immediately above the ring, a small opening sufficient to admit the end of the director, after which the operator may determine whether the stricture is situate at the external or internal ring, by passing the director downward under the edge of the former, and feeling whether it embraces the tumour firmly or not, or by pressing the swelling below, and observing whether the fluid contents are forced upwards, so as to distend the sac in the inguinal canal.

Mr Key then proceeds to obviate by anticipation another objection, viz. that derived from the extent to which it may be imagined that it is necessary to divide the sac. On this point Mr Key, with some justice, remarks, that, in dividing the stricture from within the sac, parts that have in truth no share in constricting the *hernia*, are incised; since the sac itself and the intermediate cellular tissue between it and the tendinous margin of the stricture must be previously cut. When the knife is applied directly to the tendinous border alone, on the contrary, very slight division only is requisite; and Mr Key states, that, in two of the cases in which he operated in the manner now specified, the extent of division did not much exceed the breadth of the *hernia* knife. This, we may add, must be, however, regarded as a large division; and we have witnessed some cases, and assisted at others, in which, after a few scratches with the bistoury, the intestine readily retreated into the abdominal cavity.

On another point, the question of the disposal of the fluid of the sac, Mr Key makes some judicious remarks, which we must subjoin.

"The risk arising from the return of the fluid contents of the sac is an objection that will hardly be maintained at the present day, however seriously it may have been put forth in Petit's time, when the minds of surgeons were more impressed with the humoral pathology. The fluid is not the result of acute inflammatory action, but of simple engorgement of vessels; the blood enters the intestine or *omentum* through the arteries, but cannot return by the compressed veins; the serous parts of the blood escape by the exhalent vessels on the peritoneal surface tinged with the red particles. The absorbents of the *peritoneum* in all probability take it up, and its presence in the abdominal cavity is not productive of irritation. In every instance where the *taxis* succeeds in returning a *hernia*, the fluid, if any be effused, must be returned with it; and the same objection, as Petit justly observes, if it be worth any thing, is equally valid against returning a *hernia* by the *taxis*, as against dividing the stricture without the precaution of opening the sac to allow the fluid to escape."—Pp. 91–92.

Mr Key does not, nevertheless, recommend unconditionally and invariably to refrain from opening the sac in removing stricture in *hernia*; and he admits that there is a class of cases in which it may become occasionally, or always, requisite to lay open the sac previous to attempting the replacement of the protruded bowel. He allows, for example, that adhesion either of the intestinal folds of a protruded intestine to each other, or to the sac, or to its neck, may constitute a case in which it may be requisite to open the sac more or less extensively. The surgeon, he thinks, may in general be able to determine the presence or absence, and even the degree of looseness or firmness of adhesion, before opening the sac, by the sense of fluctuation indicating the presence of fluid, and implying loose and recent adhesion;—while the hardness and tenderness of the tumour, he thinks, may lead to the inference, that adhesion has already taken place. In such circumstances, Mr Key allows that it becomes urgently necessary to open the sac, and, if possible, to separate the adhesions,—which, in the recent state, it will always, he conceives, be easy to accomplish.

Inter-intestinal adhesions, he thinks, are of less moment; and he does not ascribe to them the influence assigned by late authors in impeding the free performance of the peristaltic motion. The bad or fatal effects attributed by several authors, especially Mr Stephens, to inter-intestinal adhesion, Mr Key thinks, we confess with quite as much reason, proceeded from the effects of peritoneal inflammation, consequent upon the previous strangulation and incarceration, and upon the operation combined. Mr Key is even inclined to carry this view so far as to infer that,—if, in those cases of hernial protrusion in which a fold of protruded intestine has been found attached to the neck of the sac, and has accordingly been detached by destroying the adhesions, yet without arresting the progress of the disease, and preventing the death of the patient,—the sac had been kept entire, and the intestine had been thus protected from handling and exposure to air,—the termination of the case might have been favourable.

In one form of adhesion, however, Mr Key admits the necessity of opening the sac. This is when the bowel adheres, or has long adhered, to the orifice of the sac in such a manner as to bind down the portion of bowel to the inguinal aperture at an angle so acute as not only to interfere with its peristaltic motion, but, by interrupting the mobility of one side of the bowel, to contract and obstruct its channel, and to impede remarkably the transition of its contents through the strictured point. The author quotes from the practice of Sir Astley Cooper a case of this description, in which the *ileum*, which was the intestine that had been strangulated, was found in the mouth of the hernial sac, and doubled back within it; the small intestine above this portion was inflamed and greatly distended, and the *jejunum* was in a state of mortification. A case of this nature, Mr Key allows, will not admit with safety to the patient of the operation being performed without opening the hernial sac. It may be doubted, nevertheless, whether the opening of the sac and the removal of the adhesions would have averted the fatal result.

A modification of the same variety is that class of hernial protrusions denominated *irreducible*, in consequence of the extensive and long-continued adhesions by which they are united, identified, and, as it were, confounded with, the sac; and as in these the symptoms are found to depend not on any strangulation of the intestine or its vessels, but a mechanical impediment opposed to the transition of the feces, Mr Key infers that opening the sac can be of no service whatever. A better plan of relief, he thinks, is presented in the division of the stricture on the outside of the sac, so as to enlarge the opening of communication with the *abdomen*, followed by the sedative effect of a dose of calomel and opium, in order to allay the irritation of the bowel, and afterwards by a mild purgative, with the view of emptying it gently of its contents. In short, the rule to which Mr Key is most partial in all cases of this kind is, to divide the stricture extensively, and enlarge the opening, in order to allow the contents of the intestine to pass onward.

The case of adherent *omentum*, Mr Key justly observes, is one which at first sight appears likely to contraindicate the method of dividing the stricture, and attempting replacement without opening the sac. Questions of this kind, however, experiment decides most satisfactorily. In the first case in which Mr Key attempted this mode of operating, viz. one of old irreducible umbilical *hernia*, in which an intestinal fold had been recently protruded,—he found, that, upon dividing the edge of the tendon, very slight pressure made on the sac was followed by the immediate retrocession of the bowel; and he therefore infers, that in all cases it would be desirable to perform the division outside the sac, and then attempt reduction; or, in other words, we should say, give the prolapsed intestine a chance of receding into the abdominal cavity. He even thinks that it is not always advisable to open the sac for the sole purpose of removing by knife or the ligature a portion of the diseased *omentum*,—according to the rules recommended and observed in cases of omental *hernia*.

The only case, in short, Mr Key thinks, which imperiously demands that the sac should be laid open, is that of gangrene of the protruded intestine; since a portion of mortified intestine returned into the abdominal cavity would expose the patient to the escape of the intestinal contents into the peritoneal cavity, certain peritoneal inflammation of the most violent and uncontrollable character, and almost inevitable destruction. Whenever, therefore, the existence of this can be ascertained, he recommends that the sac should be opened. As the diagnosis of this state of the intestine previous to cutting into the sac has not yet been satisfactorily established, Mr Key gives the following characters, in order to guide the surgeon.

"The ordinary characters of a completely sphacelated portion of bowel are distinct enough. The tumour loses its elasticity and firmness; its surface becomes more tender, or even inflamed; the skin is no longer loose, but adheres more firmly to the subjacent tunics of the *hernia;* infiltration of fluid in the cellular membrane under the integuments sometimes takes place, so that the part feels œdematous, or sometimes emphysematous, and pits on pressure. If an operation is not performed, the integuments proceed to ulceration, or show here and there spots of gangrene; a discharge of feces at length ensues, and gives the patient some relief."—Pp. 104–105.

The case of strangulation by the neck of the sac will also present itself as one demanding the incision into that investment, and the exposure of its interior; and Mr Key, though he contends that this is a rare occurrence, allows that it may happen, and that, when it does exist, the sac should be opened.

After these views, and some further illustrative statements, Mr Key proceeds to demonstrate the merits of this operation by reference to cases in which he has performed it with favourable issue.

The result of the first case, indeed, was unsuccessful, in consequence, apparently, of a large mass of *omentum* concealing a fold of small intestine at the posterior part of the sac, and which therefore remained unreturned. Both the *peritoneum* and *omentum* presented marks of inflammation. The second case also terminated unfavourably, not from refraining to open the sac, which, indeed, was done as a matter of necessity, but from abdominal inflammation continuing in a subject otherwise unfavourable, and from the *hernia* being one of the ventro-inguinal description, or which was protruded, not through the inner ring of the inguinal canal, but by a separation of the fibres of the tendon of the *transversalis*, and then through the external ring.

In his subsequent cases the result of the operation was more successful. The first was a case of strangulated umbilical *hernia*, which occurred in a woman of 67, and for which she was admitted into Guy's Hospital on the 21st February 1832. By introducing a director carefully under the tendinous opening, the stricture was divided without opening the sac, upon which the reducible portion of the *hernia* forthwith receded into the *abdomen*, with a gurgling noise audible by the bystanders,—much sensible diminution of the size of the tumour,—and immediate relief to the sufferings of the patient. On the following day, viz. the 23d, she seemed in consequence, apparently, of opium given rather too liberally, or too frequently, to be in a state of stupor and lethargy, for which she was ordered one grain of calomel every quarter of an hour, with an enema of castor oil, and fomentations to the belly, while the opium, which she was taking, was ordered to be omitted. She afterwards made a slow but, upon the whole, a good recovery.

The next was a case of femoral *hernia* in a woman of 44, in whom a protrusion of many years' duration had suddenly become strangulated. The following sketch will give some idea of the mode in which the operation was performed, and the difficulties with which it is attended. " The usual incision having laid bare the *fascia propria* of the tumour, I made a small opening in it sufficient to introduce a director up to the seat of stricture, under Poupart's ligament. As soon as the director reached the neck of the tumour, its progress was impeded; but by pressing the point downwards, it readily passed under the stricture, which was divided by a bistoury carried along its groove. Passing the edge of the knife under the stricture was sufficient to release the bowel, very moderate pressure being made on the swelling, the bowel could be immediately felt to slip back into the abdominal cavity. Scarcely any blood was lost during the operation."

The subject of this case made a speedy and complete recovery.

The next case was an instance of femoral *hernia* in an elderly female of 61, which had become strangulated on the 17th of December 1832. The operation was performed on the outside of the sac by passing the director between its adipose covering and the outer layer of the *fascia propria* below the stricture, and carrying the bistoury along its groove, so as to cut upwards and inwards. The intestine was immediately relieved from stricture, and forthwith receded into the abdomen. On the 29th, the wound was covered with healthy granulations; and on the

8th of January 1833, it was so far cicatrized as to allow the application of a truss.

The fourth case in which Mr Key performed this operation occurred in a lady of 50, and was also an example of femoral *hernia*, which had become strangulated on the 12th of January 1833. Early on the following day, when Mr Key was requested to see her, he found it requisite to operate; and the stricture was accordingly divided without opening the sac; and as soon as this was effected, upon pressing the hernial tumour slightly, its contents retired into the abdominal cavity. No bad symptom ensued, and the patient was convalescent on the 18th.

It may be necessary to give the author's description of the mode of operation, which is contained in the following extracts. We first give the mode of process for femoral *hernia*.

" The extent, as well as the form, of the incision through the integuments may seem of minor importance, except as far as it tends to facilitate the after-steps of the operation; yet it may be as well to disturb the subjacent cellular membrane as little as possible, as inflammation is less likely to follow, and to assume the form of *erysipelas*. For this reason the inverted T incision, usual in the operation for femoral *hernia*, may be in most cases reduced to a single incision, either at right angles to Poupart's ligament, or in a transverse direction across the tumour. In patients who are spare, and in whom the neck of the sac lies at no great depth from the surface, it is unnecessary to disturb the cellular membrane by turning aside the flaps of the integuments. This will diminish the suppurative inflammation, and in such cases will afford ample room for the operation. I have not made trial of the perpendicular form of incision, but a single transverse one I have found sufficient when the integuments have been loose and the tumour not large. The superficial *fascia* adheres firmly to the common integuments, and is usually turned aside with them, especially when the latter are pinched up for the purpose of making the first incision. The *fascia propria* is, therefore, quickly exposed, and forms the first distinct covering of the tumour, being darker than the more superficial cellular investment. It is under the outer layer of this *fascia* that the adipose structure is formed, and which often assumes the appearance of *omentum*. The director easily makes its way under this fatty matter as far as the neck of the sac, which lies deeper than the operator at first supposes. The point of the director should be applied rather to the inner than to the outer part of the neck of the sac, as it will be found more easily to pass under the stricture at this part. It should not at first be attempted to be thrust under the stricture, as the firmness of the parts forming the stricture would resist it. But the seat of stricture being felt, the operator should depress the end of the director upon the sac, which will yield before it, and then, by an onward movement, the director slides under the stricture. The usual seat of stricture in a femoral *hernia* is too familiar to need any elaborate description.

"The band that produces the constriction at the femoral aperture is not entirely a process from Poupart's ligament, but is also formed by a tendinous band on the fore-part of the femoral sheath, when the *fascia transversalis* passes in a funnel-form behind Gimbernat's ligament, to be inserted into the *pubis*. The thin tendinous border that descends backwards from Poupart's ligament is attached to the front part of the sheath of the femoral vessels; and any attempt to push a director under this thin border, anteriorly to the sheath, would meet with great resistance; and, if it were successful, its division would not sufficiently liberate the sac from pressure."—Pp. 142—145.

The following is the author's description of the mode of operating in inguinal *hernia*.

"In inguinal *hernia*, the incision may be so conducted as to enable the surgeon to divide the stricture either at the internal or at the external ring. The opening in the skin must be made higher than is usual in the ordinary operation on a bubonocele. The incision should begin at the neck of the tumour, or where it seems to quit the *abdomen*, and should be continued downward for about an inch and a-half. This will lay bare the lower portion of the external oblique tendon where it forms the ring. A small opening should then be made in the tendon, just above the ring, sufficient to admit the end of the director, which will enable the operator to ascertain if the stricture be at the lower or upper opening. The size of the *hernia*, and the length of time it has existed, will, in some measure, serve to guide him; but he may immediately decide the point by passing the director downward under the edge of the external ring, and feeling whether it embraces the tumour firmly or not, or, by making pressure on the swelling below, he may feel if the fluid contents of the tumour can be forced upward above the ring, so as to distend the sac in the inguinal canal. This point being decided, if the stricture be at the lower ring, he has only to pass his director under its margin, and to divide it to a sufficient extent.

"If the stricture exists higher up at the neck of the sac, where it will be found in the majority of *herniæ* of this description, the opening in the tendon should be enlarged to the extent shown in the second drawing, for the purpose of passing the director under the deeper stricture. The lower margin of the two muscles will be brought into view, with some of the descending fibres of the cremaster. These may be separated by disturbing the cellular membrane with the end of the director; and the instrument may then be introduced under the *transversalis* muscle, till it reaches the stricture. In the subject, the director, when introduced in this manner, passes before the *transversalis fascia;* this will diminish what little risk there may be of wounding the *peritoneum*, and will carry the knife further from the epigastric artery; the tenuity, however, of this *fascia* will, perhaps, often allow the director to pass beneath it. The instrument should be depressed upon the sac, in order to carry its point under the border of the *transversalis*, which may be divided to the extent required. This operation is more difficult than the division of the stricture in femoral *hernia*; the principal difficulty lies in the accurate separation of the lower edge of the internal oblique muscle, for the easy passage of the director. Drawing II. represents the parts, with the instrument passed under its edge. The stricture, however, is not so firm in inguinal as in femoral *hernia*, and the introduction of the director under the *transversalis* tendon will not be difficult, when it is fairly passed up to the neck of the sac before the attempt is made. The steps of the operation will be much the same in those smaller *herniæ* which are lodged in the inguinal canal. When the stricture is divided, a greater degree of pressure will be required to return the contents of a large inguinal *hernia*, on account of the distance from the neck of the sac to the bottom of the tumour, and especially when the *omentum* forms a part of its contents."

We have given the foregoing account of the operative method proposed by Mr Key, of the advantages by which he conceives its merits are recommended, and of the forms of hernial protrusion to which it is adapted, without comment or remark, in order that our readers may be enabled to understand the reasons in favour of a method of operating so opposite to that usually inculcated,—and to judge of their validity by the test of sound physiology and pathology. Different as the method may appear to be in principle and practice from that usually followed, it is certainly entitled, coming as it does from an hospital surgeon of acknowledged ability and observation, to serious attention. In the course of perusing, however, the memoir of Mr Key, and reflecting attentively on the facts and arguments which he has adduced in recommendation of the method of dividing the stricture without opening the sac, it has suggested to us several circumstances which we feel it our duty to state,—partly with the view of showing that we should like to have some more evidence, before this method be admitted as an established rule,—and partly, in order to obtain from surgeons of such experience and observation as Mr Key a satisfactory solution of the difficulties which we have now to submit.

We have already admitted to a certain extent the truth of the general fact stated by Mr Key of the extraordinary fatality of operations performed for the removal of strangulated *hernia*; and we willingly allow that death often takes place in circumstances in which, at first sight, and upon a general view, a more favourable issue might be expected. This is a circumstance, indeed, so repeatedly observed by surgeons, both in this country and upon the continent, that it would be idle to deny it. It has been remarked by Pott, and by Hey, by Scarpa, by

Monteggia, and by Lassus, and others; and we confess that we have had occasion to bear testimony to the same result.

But while we thus admit the fact, we doubt whether the cause assigned by Mr Key exercises all the influence which he ascribes to it. In strangulated *hernia* it is not merely the peritoneal inflammation that constitutes one of the causes of the fatal termination. A very severe injury, sometimes of a nature totally irreparable, is inflicted upon all the tissues of the intestine, that is to say, not only upon the peritoneal, but upon the muscular, the mucous, the filamentous, and the blood-vessels. It hence results, that in every *hernia* inflammation attacks not only the peritoneal coat, but all the tissues of which the intestine is composed; and severe as peritoneal inflammation alone is, and violent as are the symptoms to which it gives rise in the system, the whole of these are aggravated by the concurrence of a simultaneous state of the muscular and the mucous coat.

But this is not all. Strangulation produces such an impediment to the circulation as to cause for the time *asphyxia* of the bowel.

Thus, when a loop of intestine descends either into the inguinal canal, or the crural arch, or is protruded through the *umbilicus*, or any other aperture in the abdominal walls, so far that it cannot be immediately returned, not only does the ring of constriction interrupt almost immediately the free circulation of the protruded part, causing thereby a great degree of capillary and venous congestion, and the consequent effusion of dark bloody-coloured serum from its peritoneal surface, but, by the mere mechanical injury inflicted upon its tissues, it speedily induces peritoneal inflammation, from the strictured point spreading upwards over the unprotruded intestines. The protruded portion, also, distended with alimentary matters, which are prevented from passing onward, becomes every hour more distended; and, consequently, its component tissues, but especially its muscular coat, are subjected to so great a degree of mechanical stretching, that their vital properties become impaired, or even eventually destroyed, so that although the cause of constriction is removed, the protruded and strangulated portion of the intestine is no longer, when returned into the *abdomen*, capable of recovering its healthy functions.

It hence results, we conceive, most indisputably, that the morbid process, and its attendant symptoms, in a portion of strangulated bowel, after it has been replaced, bear no proportion to, and are not to be estimated by, the degree of peritoneal inflammation, but are to be estimated according to the degree in which the bowel has been distended, and its muscular coat preternaturally stretched. This injury, also, it is to be remembered, varies in different parts of the bowel. Above the strangulated point the intestine is necessarily distended by the impediment presented to its contents in passing onwards. At the strangulated point it is necessarily so tightly pinched as almost to extinguish its vitality. Through the whole strangulated portion it is reduced to such a state of *asphyxia*, that, if continued for several hours, death, especially of the muscular and mucous coats, is almost inevitable. Is it wonderful, then, we would respectfully ask Mr Key, that, when a strangulated intestine has been released and reduced, recovery is not effected? The operation, indeed, and replacement of the bowel in the abdominal cavity, removes the cause of strangulation, but does not remove the injurious effects to which the strangulation had given rise. If the strangulation has been long continued, and if the stricture has been very tight, and has completely interrupted not only the circulation of the strangulated part, but the transition of intestinal contents through it, it is easy to see that it must be difficult in the extreme, if not impossible, for the parts to return to their natural state.

It must, indeed, be distinctly borne in mind, that in the three portions of intestine,—the constricted, the strangulated, and that above the strangulating point, three different conditions exist, and give rise to three different processes. In the first, we recognize the immediate effects of the direct application of a ligature more or less tight,—constrictive bruising, and laceration, death in a circumscribed ring or line, and consequent gangrene. The portion of intestine, in short, which is immediately surrounded by the stricture, may be so closely constricted as to produce immediate death of the part at the point; and, besides numerous instances of this upon record, several are mentioned in the recent work of Velpeau.

It is almost unnecessary to advert to the state of the strangulated portion so often described, and which has been very happily illustrated in various parts of the memoir of Mr Key. But we must observe, that in this second portion, we recognize great vascular congestion, interruption of the circulation, consequent effusion of serum into the filamentous tissue and the cavity of the sac, and such a degree of partial *asphyxia* of the incarcerated portion, as often inevitably insures death of the part, or at least such an extinction of its vital properties as is followed by a low reactive congestion, which proves fatal. While this part, however, is incarcerated, it is incapable of the open action necessary for inflammation; and hence the traces of this process must not be expected, and are never observed, at the instant of operation.

In the third portion of the intestine, viz. that above the stricture, it is totally different. As this is the portion which is sufficiently injured to excite morbid reaction, but not so much as to extinguish or oppress its powers, all its tissues necessarily enter into the intense form of inflammatory action, which produces different effects in each, according to its properties, and the degree of injury. The *peritoneum* is simply inflamed, diffusely or in points,—spreading, however, as the cases recorded in the present memoir evince, from the point of strangulation. The filamentous or cellular tissue of the bowel also partakes in the same process, sometimes with the same effects. The mucous tunic much distended by *flatus* and fluid contents, which cannot be propelled onwards, also becomes inflamed in an intense degree. But the muscular coat is the tissue which suffers most in all this mischief, since it is not only subjected to an inordinate distension, which its structure and properties are ill-calculated to endure, but becomes the seat of a form and degree of inflammation which leads speedily to gangrene and death. All surgeons must be aware of the incapacity of muscular tissue either to bear injury or inflammatory action; and that of the intestinal tube is as little capable of these states as the external muscles. This state the operation cannot remove immediately, because it has taken some time to be established, and because no remedies can operate directly on the injured bowel.

It is well known that muscular tissue bears distension very imperfectly, and that all inordinate distension of this tissue tends not only to bruise and rupture it, but to enfeeble its irritable power, and to impair and destroy its vitality. It is chiefly by the irritable power being not completely exhausted, that the vomiting in *hernia* and *ileus* becomes so obstinate; and, when it is no longer able to propel its contents downwards, it necessarily forces them in the only direction in which they can proceed, viz. upwards. But to this, even, there is a limit; and, as the obstruction continues, the distension may proceed to such an extremity as with facility to rupture the intestine above that protruded. Long, however, before this result takes place, the patient sinks under the influence of an injury so severe. We have seen an instance in which, from an unrelieved internal stricture of this kind, a portion of *ileum* six inches long was distended by fluid and gaseous intestinal contents, until it had attained a size not much less than that of the stomach.

It is remarkable, that, though Mr Key expressly mentions that the inflammation is found to spread from the strangulated portion over the unstrangulated, and not to have its origin in that which was included in the sac, he fails to draw from this circumstance the inference which we regard as the just one,—namely, that all the mischief is induced by the strangulation and its effects, and not by the mere incisions, or the exposure of the protruded portion. We must repeat, indeed, that this mischief has been completed in a large proportion of cases before operation; and that, while it cannot be diminished, physiologically speaking, by the operation, there is little reason to believe that it is augmented or aggravated; and we must further observe, that, consequently, no inference can be drawn as to the presence or absence of inflammation from the appearance of the strangulated intestine; and that, while the latter is merely congested, a most intense and probably fatal degree of inflammation may exist in the portion above the stricture.

Numerous other arguments to the same effect might be adduced; but on these our limits will not permit us to dwell longer.

These observations we now submit to Mr Key with the deference which is due to a surgeon of his skill and experience, in order to suggest the question,—whether the degree of fatality after operations for strangulated *hernia*, may not be ascribed to the injury necessarily inflicted upon a large part of the intestine, by being subjected for the space of ten, twelve, twenty, or thirty hours, nay, sometimes for a space of two days, or even sixty hours, before any attempt is made to relieve it.

We do not deny entirely the influence of handling the intestine, chilling it, and exposing it to the air, as represented by Mr Key. But we think it may be fairly doubted whether its influence be so great as that of the previous mechanical injury. Even in the unsuccessful cases recorded by Mr Key, we conceive that the length of time during which the intestine was strangulated was sufficient to render any operation abortive. It is clear that it is impossible to specify any exact time within which all this injury may be effected; for it will vary in different cases, according to the degree to which the circumference of the bowel is enclosed, and other circumstances; and in one person strangulation for six hours may perpetrate as much mischief as in another for twenty-four hours. But it is clear, that, when the intestine is strangulated for any space of time beyond twelve or sixteen hours, the chance of recovery is exceedingly limited. In the cases detailed by Mr Key, strangulation appears to have continued for not less than twenty or twenty-two hours. In one case it was strangulated for two days; in one for three days; and in two cases for ten days. In three of the cases the duration of the time is not mentioned. But there is reason to believe that strangulation must have continued longer than in any of these in which the duration is specified.

From these facts, we think it may be justly inferred, that, if the fatal termination is in some degree to be ascribed to opening the sac, and handling, chilling, and exposing the intestine, it is in a degree still greater to be ascribed to the mechanical injury inflicted upon the intestine previous to the operation. We do not disapprove entirely of the plan of relieving the stricture without opening the sac; because, in all instances in which that method is practicable, and in which the stricture can be completely relaxed without opening the sac, that method may be first attempted. It is clear, at all events, as Mr Key has observed, that if the operator finds, upon attempting to reduce the protrusion, that this can be accomplished without opening the sac and exposing the intestine, this course ought to be observed; and if, upon doing so, this is inadequate to effect the replacement of the intestine, the sac may then be opened, and reduction completed. In short, while Mr Key must be allowed to have demonstrated the practicability of reducing a protruded intestine without opening the sac, it may also be regarded as the safest plan to attempt the operation in this manner in the first instance, and eventually, if it be found insufficient, to open the sac, and attempt replacement of the intestine in the usual mode.

Another rule still more important, however, and indispensable, we would impress in the strongest manner, with a view to diminish the proportion of mortality after the operation; and this is, in every instance, in which the symptoms of strangulation are distinctly marked, to lose no time either in the administration of *enemata*, the warm-bath, tobacco injections or insufflation, the *taxis*, or any species of manipulation whatever, but to proceed immediately with the knife, to expose the tumour, and relieve the stricture. It is the delay and loss of time occupied in the adoption of these measures that we must still regard as the main cause of the unfavourable result of operations for strangulated *hernia*; and every instant that is lost after strangulation of the intestine is recognized, diminishes remarkably the chance of the intestinal tissues recovering their circulation and other properties.

It is also to be borne in mind, with a view to recommending the early adoption of the operation, that the surgeon has in this instance not to deal with a dead, insensible, or inirritable part; and that if he operates early, or in due season, the object of his operation is actually promoted by the intestine itself. It is a remarkable fact, dependent apparently on the principle of irritability, with which the intestine is endowed, that, if the stricture be relieved before the intestine has become so much distended as to lose its contractile power, the moment that the stricture is relieved, the peristaltic motion of the intestinal canal evinces a disposition to withdraw into the cavity of the *abdomen* the protruded and hitherto strangulated portion; and hence it results, that very slight or almost no pressure appears to be followed by replacement. We have even seen a portion of protruded and strangulated intestine withdrawn from the sac into the *abdomen*, the moment the stricture was divided,—a result certainly dependent upon the muscular contraction of the intestinal tube itself. This effect, however, can only be expected to take place if the stricture be divided soon after strangulation.

It is time, however, to conclude these remarks, the length of which has been demanded chiefly by the importance of the subject of the memoir of Mr Key. Though we feel that we cannot conscientiously adopt implicitly all the views of the author, we must admit that he has shown great ingenuity in attempting to explain the frequent fatality of an important operation, and much skill in attempting to obviate its supposed disadvantages. Before the operation which Mr Key proposes can be generally adopted, its merits would require to be tried in a much greater number of cases, and by different hospital surgeons. In the meantime, it is certainly a fair subject of experimental inquiry for surgeons; and its advantage consists, as already stated, in this, that it may, in most circumstances, be tried first, and, if found incompetent to the object in view, it is easy to modify the operation so far as to open the sac.

ART. VII.—*Observations on Injuries and Diseases of the Rectum*. By HERBERT MAYO, F. R. S., Surgeon to the Middlesex Hospital. London, 1833. 8vo. Pp. 220.

INJURIES and diseases of the *rectum* are peculiar in several circumstances. It is so difficult to recognize their presence that they are often altogether overlooked. They are found to give rise to various complaints, which have been often attributed to other causes. They are of very frequent occurrence among the inhabitants of large towns, and are always excessively inconvenient, and often attended with severe pain. And lastly, when their presence has been ascertained, it is extremely difficult to conduct their treatment, and to apply remedies so as to prove curative.

The appearance of a work, therefore, upon the nature of these injuries and diseases, and the best mode of treating them, by a surgeon of the anatomical knowledge and practical experience of Mr Mayo, cannot fail to excite much interest, and is entitled to a large share of attention from all practitioners of every department of the profession. There is, indeed, scarcely any subject, in the attentive consideration and accurate knowledge of which, the physician, the surgeon, the accoucheur, and the general practitioner are all so equally and generally interested. The influence which the healthy state of the *rectum* exercises upon the functions of digestion must make it an object of serious attention to the physician and general practitioner. Its local diseases, and the method of removing them by local treatment or operation, obliges the surgeon to be intimately acquainted with its healthy structure and processes, and their deviations. The intimate connection which subsists between the womb and *vagina* and the *rectum*, both in health and disease, must make the conscientious accoucheur feel it necessary to possess more than an ordinary knowledge of the affections of the latter organ. And if these individuals, in their separate functions, feel the force of such obligations, how much more strongly must they be shared by him who is habitually called upon to unite in his individual person the characters of all three.

In the present volume, Mr Mayo treats in eight separate chapters of the following subjects:—1. Fissure and Laceration of the *Rectum*; 2. Protrusion; 3. Hemorrhage and pain of the *Rectum*; 4. Piles; 5. *Fistula*; 6. Constipation and the use of Instruments; 7. Stricture; and 8. Cancer of the *Rectum*.

In the first chapter Mr Mayo treats not only of fissure and laceration, but of ulcer of the *rectum*, laceration taking place during labour, and laceration produced occasionally by the employment of injecting instruments. He mentions one case in which the pipe of an injecting instrument must have lacerated the *rectum*, in a boy who had undergone the operation of lithotomy, and adduces another in which the *rectum* had been torn by an injection-pipe, and death had been occasioned by the injection of a pint of water-gruel through the laceration into the abdominal cavity.

In treating of laceration during labour, partial or complete, Mr Mayo recommends the formation of a new *recto-vaginal septum*, in the manner recommended by Dieffenbach.

In treating of protrusion of the *rectum*, Mr Mayo begins by rectifying a misrepresentation of the nature of that accident by M. Dupuytren and others, by whom *prolapsus ani* is said to consist in extrusion of the mucous and submucous coats, by the irregular action of the muscular coat. Mr Mayo, on the contrary, shows, from a preparation preserved in the museum of King's College, that the muscular coat of the bowel may be equally inverted with the mucous membrane and submucous tissue. He further infers, from the phenomena of a case in which he had extirpated the lower part of the bowel with its *sphincter*, with the effect of producing protrusion, that the chief use of the *sphincter* is to prevent protrusion and eversion of the *rectum*.

If this inference be well-founded, it would result that no protrusion could take place, unless in consequence of rupture, or partial destruction, or excessive relaxation of the *sphincter*.

To demonstrate the serious effects that result from neglecting this complaint, Mr Mayo relates the leading circumstances of an instructive case of *prolapsus*, which had existed from an early period in a young lady of 20, and in whom it gave rise to a series of intensely acute sufferings in the head and alimentary canal, with painful and irregular menstruation; pains in the back and legs; and *hysteria*. The manner in which this complaint was cured was by operation in the following style.

> " A small fold of intestine was pinched up with forceps, and tied with a silk ligature. Care was taken to include the mucous and submucous coats alone in the ligature: the whole surface included was less than that of a sixpence. Before finally tightening the ligature, the surface of the little fold was cut with scissors. Three such folds were tied on opposite aspects of the bowel, and at different distances from the *sphincter*. The patient hardly felt the operation, so small is the sensibility of the internal parts of the body, unless when inflamed. The parts were then replaced. During the four days which followed the operation, the patient was not allowed to sit up; and the bowels, which had been well unloaded before, were kept confined, very light and moderate liquid nourishment alone being allowed, and an enema of laudanum having been administered. Upon the fourth day, when the bowels were moved with an enema of warm water, the patient was greatly disappointed at finding that the protrusion returned; yet she remarked, that the bowel admitted of being replaced with greater ease than before. Some little soreness in the part, however, was now observed; some blood was passed from the bowel; there was irritation in the bladder; and now, for the first time, protrusion of the bowel attended the act of micturition.
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> " Upon an examination of the bowel on the sixth day after the operation, it was found to be in the following state:—The mucous membrane, when the bowel was extruded, appeared fuller and more loaded with blood than before the operation. The little portions of membrane which had been tied had come away; but the ligatures had not yet separated, but remained fixed in the shallow ulcers which they had produced: they were removed. From this time the local complaint improved daily; the protrusions became less and less, then did not recur each time the bowels acted, and in a fortnight had entirely ceased to appear."

The foregoing operation Mr Mayo regards as equally void of risk and pain, and much superior to that recommended by M. Dupuytren, which consists in removing several marginal folds of integument.

In another case of simple *prolapsus*, which occurred in the person of a man of 65, admitted into the Middlesex Hospital in March 1830, it was found necessary, as the protruded portion was swelled, scarlet-coloured, and very tender and painful, to empty its blood-vessels by means of leeches, and allay irritation by an anodyne poultice, and a dose of calomel and opium, after which reduction was easily accomplished.

A protrusion of the same kind, induced in a stout young gentleman of 22, after a continued debauch of drinking for about twelve hours, and which gave such extreme pain, that the patient could neither walk, sit, stand, nor almost lie in comfort, we succeeded in replacing only after copious blood-letting from the arm, aided by castor-oil, opiates, and low diet. All manual efforts to replace the bowel produced the most agonizing pain; but after the depletion the bowel receded without effort. There is reason to believe, that, in cases of this kind, the *prolapsus* is a mere symptom of inflammation of the rectal mucous membrane, —a species of *proctitis*; and that, until this inflammatory disorder be thoroughly subdued, it is in vain to attempt, either by art or by force, to replace or retain the protruded bowel.

Hemorrhage from the *rectum* in a moderate degree, and not long-continued, but subsiding spontaneously, Mr Mayo regards as a species of safety-valve to the abdominal circulation,—reviving thus the doctrine originally maintained by Stahl and his adherents on its salutary influence. When it proceeds to an extreme degree, however, either in quantity or by frequent recurrence, and when it enfeebles the powers, and blanches the countenance of the patient, he considers it as injurious, and requiring different means for checking its progress, as astringents and opiates, either by the stomach, or in the form of enema.

We have known a case of this description in which the hemorrhage was so obstinate and enduring, and attended with such debilitating effects on the system at large, that it led to the suspicion of one or more open vessels; and when the bowel was carefully examined, this was found to be the case, and to require the application of a ligature; after which the hemorrhage subsided, and the individual gradually recovered his usual strength and looks.

On the subject of pain, we find little precise or satisfactory information; but we are given to understand, from the circumstances of one case, that paroxysms of this kind may depend on syphilitic or mercurial action.

A good account of the characters of piles is given in the fourth chapter. The most interesting part of it relates to a mode of treating internal piles, by washing the inner surface of the *rectum* regularly every day, as accurately as is practicable, with a strong lather of brown soap and water.

In cases in which local treatment of this kind is believed inadequate to remove the disease, or reduce it to a state of quiescence, Mr Mayo expresses a preference for the extirpation of these tumours by the ligature over the method of excision. The pain of both, he states, from the testimony of different patients, is nearly equal; but the ligature has the advantage over the knife, in not giving rise to hemorrhage, which, in the latter case, is often serious.

In the internal or medical management of this complaint, Mr Mayo, like most of the London surgeons, is very partial to the use of the preparation known by the name of Ward's Paste, and which is represented in the Pharmacopœia by the *confectio piperis composita.*

In treating of external piles, Mr Mayo relates a case which illustrates the connection subsisting between them and internal piles, from which it may be inferred, that the former disease very often, if not always, originates from the latter; and that when the internal piles disappear, it merely passes into a quiescent or inactive stage, or, to speak more strictly to the fact, the vessels of the *rectum* shrink and contract to their original calibre, while the sero-albuminous or sero-sanguine fluid, which was effused during the active or inflammatory state, is condensed into a small, soft, pendulous tumour. These inferences, though not distinctly expressed, are implied in the case and observations advanced at p. 86–89.

In the fifth chapter, devoted to the subject of *Fistula Ani*, Mr Mayo takes a just view of the origin of that complaint in the unhealthy suppurative and disjunctive inflammation *(proctitis)* to which the adipose and filamentous tissue surrounding the *rectum* is so peculiarly liable. Into the details of this subject our limits will not permit us to enter. But we may recommend to the particular attention of readers the account of the progress and symptoms of the disease given by Mr Mayo, as one derived from careful observation and very just views of its pathology and treatment.

Such a tumour as that formed in the manner now mentioned round or on one side of the *anus*, Mr Mayo thinks it is improper to open by a large incision, which, he remarks, almost invariably evinces an indolent and intractable character,—but rather by several punctures by the lancet, sufficiently large to give vent to matter and sloughs. This practice, Mr Mayo justly observes, is the more necessary, that, if adopted early, it may prevent the formation of *fistula*, and may supersede the necessity of the appropriate treatment of that disease.

Mr Mayo justly represents *fistula*, however, as not in all cases requiring operation for its removal; and he allows that the complaint, if occurring in young persons of otherwise sound constitution, may be successfully treated by means of mild aperients and wholesome regulated diet, aided by astringent local applications, and the *confectio piperis composita*, internally. When the disease occurs in those with pulmonary affection, he justly dissuades from employing the operation.

If we pass over the sixth chapter, on Constipation of the Lower Bowels and the Use of Instruments, it is not because of its want of interest and practical importance; and to all orders of the profession we recommend strongly its attentive perusal, as well calculated to explain to them the origin of a numerous class of cases of constipation, viz. those dependent on some atony or torpor of the colon and *rectum*, and on the precaution to be observed in the use of instruments, which are now so frequently and universally recommended for the relief of every species of disorder of the alimentary function. This chapter, indeed, is more of a medical than a surgical character, and merits the particular attention of the physician and medical practitioner generally.

In the seventh chapter, the reader finds an instructive account of Simple Stricture of the *Rectum*, and its effects on the general health and the alimentary function. As the following case occurred in the person of a physician, and exhibits at once a just view of these general effects, and of the means by which they were alleviated and finally removed, we subjoin it in the excellent description of the patient.

> "In my life," says the writer of this communication, "I never knew what it was to have a single action of the bowels without the aid of medicine, or to be free for many hours together from all the wretchedness of disorder and of remedies in conjunction, excepting for two short intervals of time, during one of which I trusted simply to the use of injections of warm water, and during the other, when I took the white mustard seed, and that with so singular an effect, that for a while I thought I had quite got rid of my complaint. With the exception of these two intervals, I have never been able till lately to say there is in life that which is worth living for, or in other and more proper words, I did not know what it was to wish to live. To say nothing of the medical discipline which I have undergone again and again, I have been examined and treated for stricture of the *rectum* and of the sigmoïd flexure of the colon for years, and for years never passed any thing from my bowels larger than a horse-bean, if solid, or of the little finger, if of a softer consistence. Oftentimes have I been quite incapacitated for exertion, and never able to enter upon my professional duties with any thing like alacrity or cheerfulness. It is now nearly two years ago since I came to the resolution of abandoning all remedial measures: to leave off at once physic, injections, and the bougie: to take nothing in the shape of food that could by possibility irritate the stomach or bowels, and to leave them to act, of and for

themselves, when they could no longer retain their contents. I had, as you may suppose, difficulties in bringing about so entire a change. At first I suffered much inconvenience from a sense of fulness in the bowels and in the head. But this I contrived to obviate by the very occasional use of an injection of warm water, determining with myself to overcome the disposition to contraction by making the contents of the lower bowels the means of dilating them. By a steady perseverance in this course of discipline, I have perfectly recovered; know nothing now of that distress of feeling, which for at least twenty years made life burthensome to me; I have seldom or ever occasion to have recourse to medicine, and then only as a man in perfect health would do. I should tell you, that at one time such was the state of the stricture in the *rectum*, that the largest sized urethra bougie alone would pass, and that at another the contraction was so far in the intestine that a bougie of three feet in length was considered necessary to reach it."—Pp. 156–159.

All this mischief Mr Mayo attributes to spasmodic or simple stricture, that is to say, stricture without organic change in the tissue of the bowel, but does not attempt to specify any particular point of the bowel as more liable to this affection than another. From such cases as that now detailed, he, on the contrary, draws the inference, that the upper part of the *rectum*, or the sigmoid flexure of the *colon*, are liable to irregular contractions of the muscular tunic, capable of obstructing the passage of the feces, and resisting the introduction of instruments. This irregular action, again, he ascribes to vitiated secretions in the upper part of the tube, and infers that, though instruments may be occasionally useful, and should not be entirely neglected, they are quite inadequate to the effectual removal of the complaint without regulated diet, the use of alterative medicines, and the administration of injections.

To demonstrate farther the necessity of caution in the employment of instruments, and the possibility of the existence of a degree of tenuity and delicacy in the structure of the *rectum*, of which some practitioners appear to be quite unaware, Mr Mayo gives the following melancholy detail, furnished to him by Mr Crosse of Norwich, as having occurred in the hands of a provincial surgeon.

" A young woman, of delicate frame, was supposed to have stricture of the *rectum*, which led her medical attendant to employ in no very gentle manner a firm bougie. After much difficulty the instrument was made to pass; but the patient in a few hours became very ill, vomited, and was chilly, and in about forty-eight hours died. It was found that the bougie had perforated the coats of the bowel at the sigmoid flexure, about seven inches from the *anus*, and had entered the peritoneal cavity. The preparation, which is in my collection, shows the *rectum* to be capacious for an inch or two next the *anus*; but all the rest of the bowel preserved, being a length of eight or nine inches, is very contracted, so that it would only admit a small instrument half an inch in diameter; and at the same time its coats are very delicate and attenuated, readily allowing the bougie, in the hands of a boisterous surgeon, to perforate them. There is a great abundance of adipose substance and of fatty appendages about the sigmoid flexure of the colon. The bowel presents no thickening or partial contraction, but a smallness of calibre generally, with remarkable delicacy and thinness of the coats—accounting for the presence of symptoms, during the life of the patient, which might have led to the supposition that stricture existed."—Pp. 163–165.

Mr Mayo then proceeds to the examination of the characters of permanent stricture, and the most approved mode of treating that disease; and impresses particularly the necessity of dealing with it with extreme delicacy and caution. He justly represents forcible and hasty dilatation as liable to be extremely hurtful, not only by injuring the tissue of the bowel itself, but by inducing peritoneal inflammation. The great object, in short, of the use of the bougie, in such circumstances, is not, Mr Mayo reminds the surgeon, mere mechanical dilatation, but to excite absorption in the matter, by which the tissue of the bowel is thickened and its area contracted. Superficial incisions, or division of a stricture, he regards as useful, chiefly when followed by the introduction of the bougie to prevent subsequent contraction.

In the case of ulcer or fistulous opening above the strictured portion,—a circumstance not unfrequent after long continuance of stricture of the *rectum*,—it is liable to give rise to internal *prolapsus*, or a species of invagination of one portion of the bowel within the other,—and thus induce a most complicated disorder which rarely admits of anything but palliative treatment. It is remarkable, nevertheless, that patients derive great relief from the introduction of the bougie; and Mr Mayo is of opinion that its diligent and regular employment is more urgently required in this variety of rectal disease than in the others.

In consequence of the munificent endowments by the grandfather of the late William Whitbread, Esq. M. P. and by the late Mrs Stafford, in favour of the Middlesex Hospital, for patients afflicted with cancerous diseases, a great number of cases necessarily comes under the observation of the surgeons attached to this Institution; and hence Mr Mayo has enjoyed particular advantages in observing the progress of cancer in various parts of the body. That of the *rectum* is also not unfrequent among persons applying for relief or shelter. The disease, according to the observation of Mr Mayo, is more frequent in the female sex than in the male,—a peculiarity, the explanation of which he attributes to the varying conditions of the womb, and in the shape of the female *pelvis.*

Of this disease Mr Mayo distinguishes two forms,—one originating in, if not confined to, the muscular tissue, which is partly converted into, partly contained in a firm, gristly, fibrous substance, which, from the diagram, we should say very much resembles the fibrous-waved structure often observed in cancerous parts;—the other distinguished by the appearance or growth of fungous substance, which is again induced by the deposition of scirrhous tissue, not in fibrous lines, as in the former, but in irregular amorphous masses. Is the difference of external figure and distribution in this case to be ascribed to the difference of the anatomical characters of the tissue affected? The first appears pretty certainly to belong to the muscular tissue, or perhaps the intermuscular cellular tissue, or, it may be, to both. The second, again, appears to belong either to the mucous *corion*, or to the submucous muscular tissue. This, however, we suggest as a point for inquiry; and we abstain from all conjecture on the subject.

These changes in tissue may appear not only in the *rectum* but in the *sigmoid* flexure of the colon; and in the former case, and both varieties of change, the part surrounding the *rectum* is liable to assume a firm crisp texture, resembling the state of the adipose membrane surrounding a cancerous breast.

The treatment recommended consists in allaying pain by opiates and narcotics,—with the occasional use of astringent sedatives, as acetate of lead,—removing and preventing irritation by *enemata*, or small doses of the laxative electuary, and occasional but gentle dilatation, by means of the bougie. Washing out the *rectum* by means of the flexible tube contributes much to the ease and comfort of the patient; and the urgency of the pain may be relieved by the local abstraction of blood by means of leeches.

Removal of the part affected, Mr Mayo thinks, can only be expedient when it is confined to the lower extremity of the bowel, and this principally when one side is affected. In one case only has Mr Mayo removed a portion of the entire cylinder of the *rectum*; and though it was followed by *prolapsus* or eversion of the bowel, and exposure and consequent irritation of the rectal mucous membrane, yet, as the comfort of the patient was much augmented, and she died after two years of an attack of abdominal inflammation, Mr Mayo infers, that in instances of cancer of the *rectum*, in which the disease is confined to the extremity of the bowel, and is attended with great and unmitigable suffering,—it is proper to remove the diseased parts by operation.

We have given the foregoing short and rather hasty sketch of the subjects treated in the present volume. We have only to add, that, though perhaps the present essay does not exhibit a complete view of all the disorders of the *rectum*, it is highly valuable in presenting a short and intelligible record of practical facts, by one who has enjoyed excellent opportunities, and who avails himself of their advantages with extreme diligence and great judgment.

ART. VIII.—*Illustrations of the Effects of Poisons.* By GEORGE LEITH ROUPELL, M. D. *The Plates from Original Drawings*, by ANDREW MELVILLE MACWHINNIE, Member of the Royal College of Surgeons. Part I. 1833. Folio. Four Coloured Engravings.

WE feel it requisite to advert shortly to the present valuable publication, in order to direct to them the attention of pathologists and medical jurists.

Though the effects of poisons on the gastric tissues of the lower animals are pretty generally known, yet few, comparatively speaking, can have opportunities of witnessing and studying their effects on the tissues of the human body. This defect the present publication is admirably calculated to supply; and, as many practitioners may be requested to give evidence in cases, which may be the first of the kind that have fallen under their observation, we conceive that Dr Roupell has rendered a great service to his professional brethren, by placing in their power records so faithful and accurate as the present delineations.

The present number contains four beautiful and accurately coloured engravings.

The first exhibits the appearances presented by the *œsophagus*, stomach, and *duodenum* of a dog, which had been poisoned by a drachm of arsenic. The appearances are those of the simple irritant effect of arsenic, viz. diffuse inflammation and great vascularity of the gastric mucous membrane.

The second engraving exhibits a most just view of the appearances of the human stomach in the person of a young woman, who had taken a quantity of arsenic with the view of committing suicide, and who died nine hours after admission into St Bartholomew's Hospital. Notwithstanding the use of the stomach-pump, some arsenical particles were found in the stomach. But, what is also of some importance, several of the appearances are the result of mechanical injury by the stomach-pump.

The third engraving represents the appearances of the *œsophagus*, stomach, and *duodenum* of a dog destroyed by injecting two drachms of concentrated nitric acid through an opening in the *œsophagus*. The stomach was reduced to rags, and perforated in two places.

The fourth engraving presents a very good view of the tongue, bowels, *pharynx*, and *œsophagus* of a boy poisoned by nitric acid. The base, edges, and tip of the tongue, with the lower part of the *œsophagus*, are stripped of their *epidermis*, showing the exposed surface of their mucous corion, exactly as if it had been boiled or macerated in hot water; and the residual *epidermis* is tinged of a citron-yellow colour, indurated, and easily removable,—showing the subjacent corion red and vascular.

These delineations are extremely creditable both to Dr Roupell and to Mr Macwhinnie; and we trust that these gentlemen will be induced to continue a publication so valuable and instructive.

Art. IX.—*The Code of Health and Longevity; or a General View of the Rules and Principles calculated for the Preservation of Health, and the attainment of Long Life.* By the Right Honourable Sir John Sinclair, Bart. 8vo. Fifth Edit. London, 1833. Pp. 430. With an Appendix of 136 pages.

THE first edition of this work, which was published in 1807, in four volumes octavo, assuredly contained a great variety of matter, by no means of equal merit, and some of it rather curious than useful. This circumstance, together with the fact that it was a compilation by one not belonging to the profession, certainly operated unfavourably against it; and the result was, that the Code of Health and Longevity was rarely mentioned, unless as a work altogether unfit for general use, and entirely undeserving of perusal by professional men.

Amidst much heterogeneous, and probably useless, matter, however, were several valuable and interesting pieces of information; and it was totally forgotten that the indefatigable author of the work had confined himself to the humble but useful task of collecting materials of all kinds, which he left to others for the purpose of converting to specific purposes, according to their discretion. Professional readers at length discovered the value of these materials; and we are not only prepared to acknowledge, that we have repeatedly derived useful information from the despised work of Sir John Sinclair, but we know many of our professional friends who have found it equally valuable. We shall not soon forget especially, the interest with which we perused the facts on training and dietetics, furnished by the veteran Jackson, nor the useful observations by different authors on the gradual disappearance of agues in various parts of England, under an improved system of irrigation and cultivation.

It is remarkable, indeed, that while the Code of Health and Longevity was disregarded in this country, several continental physicians referred to it in terms of commendation; and many of the facts and arguments adduced by Foderé on the improvement and sanification of countries, are derived from the authority of Sir John Sinclair.

If the first edition of this work was objectionable, by neglecting judicious selection, and by being too lengthened and voluminous, these objections, we conceive, are completely obviated by the present compact and portable shape to which the work is reduced. The materials of the whole four volumes, are, by selection, abridgement, and condensation, concentrated into the moderate space of 430 pages, in the course of which the indefatigable author has laboured assiduously and successfully to incorporate all the improvements and additions which, during the progress of twenty-five years, and five successive editions of the work, have taken place.

The appendix, which occupies about one-fourth of the volume, contains a number of separate articles on respiration, the nervous system, the individual circumstances favourable to health and longevity, the causes, effects, and mode of removing malaria, gymnastics, and the treatment of rheumatism and gout. Under the latter head, we are rather pleased to see that the author has republished the curious pamphlet of Admiral Henry of Rolvenden, in Kent, on the method by which that persevering officer cured himself of gout at an advanced period of life. Too little attention, we conceive, is paid, in the removal of chronic or habitual diseases, to the use of gymnastics, shampooing, exercise, active and passive, and the use of external agents generally; and physicians seem to be led away with the idea, that mere medicine should be applied to every thing, and that what cannot be removed by that is indeed incurable. For eradicating this prejudice, perusal of the pamphlet of Admiral Henry is well calculated. It would have rendered the work more complete if the present appendix had contained the interesting narrative by M. Chenevix, of the mode in which he cured himself of obstinate rheumatism, which had resisted all medical treatment, by means of sweating in body clothes, as given by Dr Marcet in the third volume of the Medico-Chirurgical Transactions, p. 310.

Upon the whole, the present volume is recommended to the attention both of general and professional readers, by the quantity of interesting information which it contains, and may be consulted for all the purposes for which the first edition is useful, and for many besides.

PART III.

MEDICAL INTELLIGENCE.

PHYSIOLOGY.

Anomalous position of the Larynx during Singing. By Dr **Bennati.** (*La Lancette Française, 15th October* 1833.) In a memoir read before the Academy of Sciences on 30th September, Dr Bennati gave an account of an anomaly during singing, observable in M. Ivanoffs, a Russian, 23 years of age, and *tenor contraltino* at the Italian Theatre. His voice is a counter-tenor, which is capable of reaching the deepest *sol*, or an octave below the ordinary bass voice. The tone, during the utterance of this note, resembles the fictitious voice of ventriloquists. The larynx is placed anteriorly and superiorly, as occurs in the emission of ordinary sharp sounds. This prevents the position of the superior margins of the thyroid cartilage from being ascertained. The *genioglossi*, *basioglossi*, *geniohyoid* muscles, &c. as well as those of the jaws, are contracted to the utmost. It is remarkable, that during the utterance of notes belonging to the natural diapason of this individual, the mechanism is the same as that usually observed, but when he goes lower, which he can to the extent of a whole octave, the phenomenon mentioned above occurs.

THERAPEUTICS.

Febrifuge properties of Salicine. By M. **Richelot.** (*Archives Générales de Médecine, Septembre* 1833.) The bark of the white, crack and Huntingdon willow was long ago employed in the treatment of ague with various success; but its power over the disease appeared to be very questionable. The first chemists who analyzed it discovered in it no alkaline principle similar to quinine or cinchonine, and it gradually fell into disrepute. Fontana, however, maintained the existence of a certain febrifuge principle, to which he gave the name of *Salicine.* His opinion has since been corroborated by Buchner, Rigatelli, and Leroux, the last of whom was the first to employ it in France. Numerous trials were made of it in various quarters, and, of course, from possessing the charm of novelty, its praises were sounded in no ordinary tone. Doubts, however, continued to be entertained, which were confirmed by the result of some trials made at La Charité by M. Pelletier, by which it appeared, that in his hands, *salicine*, though very bitter, seemed to be far less active than the principle of the cinchonas.

Dr Richelot mentions the trials made by various of its supporters, the results of which appear to be altogether negative, while other experiments tended to show that it is possessed of no obvious febrifuge power. The doses given in these experiments varied from six to twenty-four grains. With the view of settling the question, M. Andral instituted several experiments, the particulars of which are recorded by M. Richelot. Ten patients of different sexes, whose ages varied from 17 to 38, were selected for the purpose, and, after considering the results of these, as well as all that has been mentioned by others, M. Richelot comes to these conclusions.

1*st*, *Salicine* appears really to possess febrifuge qualities, but in so small a degree that we ought not to hesitate a moment in preferring the sulphate of quinine. 2*d*, *Salicine* may be employed in any case where irritation or inflammation exists, contraindicating the employment of the sulphate of quinine, in hectic fevers with periodical paroxysms and abundant diarrhœa, or where sulphate of quinine cannot be had. 3*d*, It is not only unnecessary but injudicious to employ it at the beginning in high doses. Six or eight grains administered between the paroxysms on the same principles as sulphate of quinine produce as good or even better effects than higher doses, though, if necessary, the doses may be increased.

Treatment of Porrigo. By Mr Macilwain. (*From Clinical Observations on the Constitutional Origin of the Various Forms of Porrigo. London*, 1833.) Mr Macilwain maintains *porrigo* to be a constitutional affection, inasmuch as, among the thousands of cases which he has treated, there have been very few which did not exhibit some unequivocal indication of disordered health. Keeping this in view, he directs a considerable part of his attention to constitutional means. The diet recommended is farinaceous food in moderate quantities. He deprecates the exhibition of drastic purges; but recommends that the bowels should be gently, though efficiently evacuated, and a course of mild alteratives afterwards prescribed. It is important to ascertain the organ primarily affected, and to restore it to a healthy state. Should it, however, prove obstinate, it must be attacked through other organs with which it sympathizes. The local treatment consists of shaving the head, and keeping it closely shaved, washing it with soap and water, and applying lightly to the affected surface, by means of a camel's hair brush, some unctuous unirritating substance. The ointment, first softened by heat, should be applied so lightly, that the affected part should appear as if lightly oiled. The dressing may be repeated night and morning,—sometimes only once a-day,—but the affected parts should be always well washed with soap and water previous to being dressed. This will always effect a cure, but the process may be accelerated by using a slightly stimulating ointment, consisting at first of a drachm of the citrine ointment to the ounce of lard, afterwards gradually increasing the strength. Stimulating, sedative, or astringent lotions, or those supposed to combine these qualities, have not been found beneficial by Mr Macilwain, who trusts principally to constitutional treatment.

New Moxas. (*Journal de Pharmacie, Novembre* 1833.)—Two new moxas have been proposed, one by M. Ferrari, the other by Dr Jacobsen of Copenhagen. The former is composed of cotton steeped in a saturated solution of the chlorate of potass, and divided into little cones, varying in size and consistence. The latter is formed of bands of paper, imbued with a solution of the chromate of potass. The one recommended by M. Ferrari is very active, while that by Dr Jacobsen burns slowly and well, which, of course, prolongs its action. The most able French surgeons approve of the latter.

PRACTICE OF PHYSIC.

On Plica Polonica. Extracted from an unpublished Memoir of Dr Marcinkowski, by A. Brierre de Boismont. (*Archives Generales de Medecine, Septembre* 1833.)—This paper contains a good view of *Plica Polonica.* The author combats the opinion, that it is a disease *sui generis*, or the external phenomenon of a peculiar affection. He denies its being at all contagious, and shows the account hitherto given of its origin to be erroneous. From a misconception of the meaning of the old Polish historians, Dlugosz and Kromer, the description given by them of the pestilence which raged on the Tartars quitting Poland and Russia, from 1285 to 1288, has been applied to *Plica Polonica*, while in reality it contains not a single word at all applicable to this disease. None of the old Polish physicians who have described this loathsome malady have mentioned its Tartar origin; and, so far back as 1662, Theodore Skuminowski opposed this opinion in a letter addressed to Plempius. One hundred and fifty years later, M. Raisin called the attention of the profession to this misinterpretation of the old writers; and Dr Weese has taken the same view in his laborious treatise.

The author maintains that no fact proves that *plica* is contagious, and argues, that it is absurd to suppose that a disease which is not communicable from one individual to another should six centuries ago be introduced in that manner. Considering, too, that this malady is confined to a circumscribed portion of Europe, and that it has never appeared as an epidemic, it is more reasonable to seek for its origin in telluric or atmospheric phenomena peculiar to the country where it appears. That the origin is to be found here, may be inferred from a religious custom of Poland, prevalent before the introduction of Christianity, of refraining from cutting the hair of children till they reached their seventh year, when it was cut off with ceremony, and they received their names. Now, as almost all the early religious rites of different nations have some reference to habits necessary to the preservation of the health, it may be inferred that this prohibition was enforced for the purpose of avoiding those accidents to which the premature cutting of hair in *plica* gives rise.

Rejecting on these and other grounds the hypothesis of Sprengel and Frank, Dr Marcinkowski investigates shortly the period at which it first attracted attention. Weese makes it to be from the year 1585 to 1595. But in the memorial of Chlendowski, it is stated that several Polish physicians, such as Albert Oczko, Serenius, and Ciachowski speak of *plica* before this period. Weese founds his opinion on a letter of Starnigelius, rector of the University of Zamosc, written in 1599 to the physicians of Padua, *de Plica.* In this letter, however, the writer does not speak of the origin of the disease, but says merely, that at that period it began to spread over the whole of Poland, having previously been mild and confined to the country between Hungary and Pokutia. It may be remarked, that it is precisely at this epoch that *syphilis* showed itself in Poland; and even now *plica* is frequently found connected with this affection. May it not be inferred from this, that, the physicians being roused to the consideration of *syphilis*, the phenomena of *plica* were more carefully studied. This is the more probable, as all the affections cited by Starnigelius as symptoms of *plica*, are nothing else than various forms of *syphilis*,—individuals affected with which and their offspring, according to his own account, were attacked with *plica*.

Externally, the *plica* attacks the organs belonging to the *epidermis* and hair, and their secrction, which in a healthy state furnishes horny matter, being altered by an unknown cause, gives rise to matting of the hair and hardening of the nails.

It is wrong to attribute this affection to want of cleanliness. There is no doubt a spurious form of the disease, which, however, is very easily distinguished from true *plica*. In true *plica*, the hair cannot be restored, by any effort, to its former state; while in false *plica* it may be easily disentangled. In true *plica*, the hairs lose their elasticity and lustre, assume a marble appearance, and, notwithstanding the glutinous matter which entangles and glues them in a thousand ways, they continue dry, excepting at the root, which is impregnated with moisture, while the secretion of the altered horny matter lasts. This will give a sufficiently clear idea of *plica*. It is only in books that we find fantastical descriptions of hairs bleeding when cut, and being endued with extraordinary sensibility.

Plica may show itself under another form, which may be regarded as its second stage. In this state, the matting of the hair is seperated from the scalp by healthy hairs, which have pushed from the root, and the horny secretion ceases. When these have grown a few inches, the hair may be cut without inconvenience.

The other varieties depend altogether on the length of the hairs, their disposition to curl, or on the intensity of the disease.

Hardening of the nails sometimes accompanies *plica*.

On examining individually those afflicted with this disease, it will appear that all present, or have presented, symptoms of the acute or chronic diseases found in the rest of Europe; but on their return to health the morbid secretion of the hair stops, the hairs begin to spring in a healthy state, and the *plica* may then be separated without any inconvenience.

Dr Marcinkowski considers *plica* to be a morbid affection appearing only after various other diseases,—in a word, as a *local endemic crisis*. The truth of this will bo demonstrated by examining the different ways in which *plica* always shows itself as a critical phenomenon, at the same time that it will exhibit its affinity with the critical efforts observed in other countries.

The first species is that which shows itself at the termination of severe acute diseases, such as are suddenly relieved by the appearance of abundant hemorrhage, powerful sweats, deposits in the urine, &c. In such cases the author has seen perfect entanglement of the hair supervene in so short a period as twelve hours, thus forcing him to consider *plica* as a crisis favourable to the patients, who some moments before appeared to be on the brink of the grave.

All these cases occur in vigorous young men attacked with violent inflammation of the brain or the chest, or affections of the *abdomen*, preceding or accompanying severe fevers. In this last case the author has never seen any peculiar symptoms which announced the crisis of entanglement of the hair. There are two critical movements which appear analogous to this form of *plica*, the one the vesicular eruption around the lips, frequently occurring simultaneously, with the abrupt cessation of affections known under the name of gastric fevers,—the other the gangrenous patches on those parts of the body subjected to pressure.

To complete what is to be said on the developement of *plica*, as considered as a perfect crisis of acute diseases, it may be observed, that the author ranks in the same category numerous cases where *plica*, not by itself, but in conjunction with other secretions, has contributed with them to the cure.

The second species of *plica* considered as a crisis differs from the first only by its slow progress, conformable to the nature of the affections. Almost all chronic diseases are the result of an acute affection, which very often is insignificant at first, and does not attract attention, especially in infancy. But at length, from repeated attacks of the evil, the organization exhibits traces of its ravages. It happens, too, that acute diseases, of which the seat, extent, and force, are perfectly known, terminate neither in the death of the patient, nor in a salutary crisis, but, arrested in their ordinary course, leave the affected parts in a state of morbid sensibility. Considering, then, the means of which nature avails herself to remove the obstacles which oppose the play of the functions, we find this tendency to critical excretions existing in acute diseases which have regularly run their course. Art itself, in these circumstances, proposes to assist nature to facilitate the evacuation of the morbid matter. Blisters and issues are but artificial critical excretions.

It is precisely in these circumstances that *plica* appears in Poland, especially among the peasants and poor inhabitants of towns, who, deprived of medical aid, and ignorant of the necessity of having recourse to it at a period when these diseases might be prevented from passing into the chronic state,—blinded by prejudice and incredulity,—obstinately refuse to claim the assistance of professional men, and lay the blame of all their ills on the *plica*.

Although, from the improvement of medicine, the disease has been less frequent and more mild in towns, it is not the case in the country; and, on entering the habitation of the artizan, or the cabin of the peasant, all the troublesome influence of chronic diseases is found. The military hospitals furnish the best proofs of what can be done by skill and attention. In them cases of *plica* are very rare, because military physicians are accustomed to attack acute diseases with vigour.

To the views here stated two objections may be started,—1*st*, That the *plica* having become an actual dead body, may be renewed without the developement of another disease; and 2*d*, the primitive disease may be radically cured, and the *plica* may continue its developement, however healthy the individuals may appear. In reply to the first, it may be stated, that in chronic diseases there occur seasons when the malady has not disappeared, but is only stationary. This state of relative health continues till some cause rouses the latent evil. This, which is observable in tubercles, indurations, &c. occurs also in the critical movement of nature manifested in *plica*, which ceases till some prejudicial circumstance reproduces the primary disease.

The other objection is, as it were, the reverse. Thus, the patient may be restored to health after long chronic suffering, while *plica* remains; the economy is accustomed to this morbid excretion, and the disease is purely local. In these rare cases, however, it ought to be strictly ascertained whether the primary disease be really cured.

Plica may be connected with incurable chronic diseases in the advanced stages of which it frequently appears. When this happens, the suffering is often much alleviated; and, when the affection of the hair is attempted to be removed, deadly exacerbations soon manifest themselves. When the alteration has reached the last degree, the salutary influence of *plica* disappears entirely. The author, however, has not observed it to occur as a morbid symptom, like colliquative sweats and *diarrhœa.* In some rare cases, the secretion of horny matter goes on with singular activity, the hair grows more rapidly, and becomes as thick as horse-hair.

After this attempt to ascertain the nosological rank of *plica*, the author proceeds to consider its causes and treatment.

The causes of diseases are generally divided into two classes,—those which act on a great number of persons, and those which act on individuals, and in special circumstances. In the first class are ranged epidemic and endemic influences, and to it belongs the external cause of *plica.* Although we cannot explain the connection between the body and climate, and other cosmic and telluric influences, it may be interesting to review the countries where this affection has been observed.

Is is remarkable that it was described by physicians of neighbouring nations at an epoch more remote than that attributed to it by Polish authors. Thus *Hercules Saxonius* says, that the Germans and Hungarians who studied at Padua mentioned that this disease raged among the lower orders in many parts of their country. In support of his opinion he cites the work of Schenk, a physician of Fribourg, in which is found a quotation relative to Stadler, who wrote in 1564. After describing the *plica*, Shenk says, that individuals attacked by it believe it to be a preventive of apoplexy, palsy, mania, &c. and do not dare to cut or comb their hair. He adds, that the evil is almost endemic in Brisgau, Alsace in Belgium, and some countries of the Rhine. The people call it *Marenflechte* (the night-mare curl), because they think that the night-mare glues their hair during the night,—an opinion yet prevalent in some parts of Poland.

In the second class we find some customs peculiar to the Poles,—such as their allowing the hair to grow to a great length, and wearing for more than six months a heavy fur cap. This disregard of cleanliness, favouring the entanglement of the hair, has produced results analogous to what occurs, under similar circumstances, in hot countries, the consequence of which is frequently cutaneous eruptions. What contributes, however, most to the appearance of *plica* is the general conduct of the people at the commencement of disease. Taught by experience, that in many cases on the appearance of *plica* the suffering ceases, and imagining, whatever be the symptoms, that they are attacked by this disease, they do all they can to facilitate and accelerate its developement, because they are convinced that they cannot escape it, and because they reckon it the sign of amendment. Full of these ideas, they avoid exposure to the air, cease to comb the hair, and wrap the head up, have recourse to fumigations, and irritate the scalp with spirituous and aromatic liquors. The result is, that the secretion of the hair thus augmented, acquires, in consequence of the general disease and under the influence of endemic causes, the morbid character constituting *plica*. This prejudice is not confined to the lower orders; it is found among individuals in the better ranks, and even among physicians.

Experience has shown the insufficiency of the therapeutic rules generally applied to the treatment of *plica*. Attention to the general health, and the removal of the organic or functional disease to which it is but an accessary, constitute the general plan of treatment. During the developement of *plica*, the primary disease should alone be attended to, without studying to prevent the matting together of the hair. Dressing or cutting it prematurely may produce troublesome consequences.

To limit or prevent the appearance of *plica*, attention to cleanliness and the general health, especially to the hair, will be found the most effectual means. All diseases, too, should be properly and opportunely treated. In those villages where the priests are attentive to those committed to their care, and in military hospitals, *plica* seldom, if ever, occurs.

CHEMISTRY.

On Kreosote. By M. Reichenbach de Blansko.—M. Reichenbach of Blansko, to whose labours we owe the discovery of Paraffine, of Eupione, and Picamore, has recently found in the products of the destructive distillation of wood a new substance, which he terms Kreosote, from the Greek words *κρέας* flesh, genitive by contraction *κρεῶς* and *σωζω* I save.

This substance is highly interesting, not only on account of its chemical properties, but from its useful application to therapeutics, domestic economy, and the preservation of provisions for long voyages. Two processes are given for its preparation. By the one the kreosote is obtained from pyroligneous acid, by the other from the tarry matter which distils over along with that acid. These processes do not differ much; both are tedious, but the latter method seems to be the easier. The tarry matter yields an oil by distillation, to which, after being rectified and heated, carbonate of potash is added, to neutralize the acetic acid associated with it. The acetate of potash separates, and the oil is again distilled, care being taken to reject the first products, and not to carry the distillation to dryness. The oil that comes over is then treated with a solution of caustic potash of sp. gr. 1.12, great heat is produced, and a portion of eupione, &c. formed, which floats on the surface. These are rejected, and the alkaline solution is slowly made to boil in an open vessel. A chemical action takes place,—it absorbs oxygen from the air, and assumes a brown colour. After it is cooled in the open air, diluted sulphuric acid is added until the oil is set free. It is again distilled with water, to which a little caustic potash should be added. The oil is then separated from the water in the receiver, and again treated with a solution of potash sp. gr. 1.12, boiled as before—cooled—treated with rather an excess of sulphuric acid—poured off from the sulphate of potash—well washed with water to carry off the excess of acid,—again distilled with water, to which a little phosphoric acid is added, to saturate the ammonia associated with the oil. Lastly, it is dissolved in caustic potash, and if the preceding operations have been carefully attended to, the kreosote and the potash unite, and the mixture, when heated, leaves no residuum of eupione, nor becomes brown by exposure to the air. The kreosote may then be separated from the potash by distillation, and, although not quite pure, is sufficiently so for medical purposes. The foregoing is a very imperfect outline of the process, which will be seen to be sufficiently tedious. The processes will be found minutely described in the Annals of Schweigger-Seidal, Vols. vi. and vii.

Kreosote is an oily, colourless, transparent liquid, possessing great refrangibility. Its odour is penetrating, disagreeable, and similar to that of smoked beef. It is of the consistence of oil of almonds, and has a sp. gr. of about 1.037, at 20° Cels. (68° Fahr.) It boils at 203° Cels. (397.4° Fahr.) and is not congealed at a temperature of —27° Cels. (—16.6° Fahr.) It burns with a smoky flame. It is a non-conductor of electricity. At 20° Cels. (68° Fahr.) it forms with water two different combinations, the one containing one-fourth part of kreosote in 100 parts of water, the other, ten parts of water in 100 kreosote.

This substance forms numerous interesting compounds, with acids and alkalies. Concentrated, it dissolves the deutoxide of copper, and assumes a chocolate brown colour. At a boiling heat it reduces the deutoxide of mercury, and is then transformed into a resin, which has no longer the properties of kreosote. Nitric acid acts on it strongly, and acid vapours are disengaged. It combines with chlorine, bromine, iodine, phosphorus, and sulphur. Potassium thrown into it disappears, gas is disengaged, and potass remains combined with thickened kreosote. From this combination the kreosote separates by distillation. Concentrated sulphuric acid added in small quantities gives to kreosote a reddish colour; but when the quantity of acid is increased, the kreosote becomes black. Of all the organic acids, the acetic seems to have the greatest affinity for kreosote, uniting with it in every proportion.

This substance, when cold, forms two combinations with potash. The one is an anhydrous liquid, of an oily consistence; the other is a hydrate, and crystallizes in white scales. All the acids, not excepting carbonic acid, separate the kreosote from these combinations. With soda it forms combinations similar to those with potash. It has a great affinity for lime and the hydrate of barytes; with these bodies it forms compounds of a dirty-white colour, soluble in water, but which, when dried, assume the appearance of a rose-coloured powder.

Kreosote, in a warm and cold state, dissolves a great number of salts. Some are reduced, but the greater part are separated in the form of crystals by cooling, such as the acetates of potash, soda, ammonia, lead, and zinc, and the hydrochlorates of lime and tin. It reduces the acetate and nitrate of silver.

Alcohol, ether, acetic ether, carburet of sulphur, eupione, and oil of petroleum, combine with kreosote in every proportion. Paraffine, though issuing from the same source with kreosote, has little tendency to combine with it. Indeed, the combination cannot be effected unless eupione be present, and is in a direct ratio to the quantity of Eupione. Kreosote with difficulty dissolves caoutchouc, and only by the assistance of boiling, differing very much in this respect from eupione, which readily dissolves caoutchouc.

If to a solution of albumen in a large quantity of water a single drop of kreosote be added, the albumen is immediately coagulated. When fresh meat is put into a solution of kreosote, allowed to remain for half an hour, or an hour, then withdrawn, and afterwards dried, it may be exposed to the heat of the sun without putrifying, and in the space of eight days it becomes hard, the colour changes to a reddish-brown, and the flavour is that of good smoked beef. Fish may likewise be preserved by it. It is pretty evident that kreosote is the anti-putrescent principle of pyroligneous acid and of wood smoke.

M. Reichenbach has ascertained that kreosote does not act upon pure fibrin, which by itself is said not to be susceptible of putrefaction. Its action upon the animal economy is deleterious. Placed upon the tongue it occasions violent pain, and when poured in a concentrated state upon the skin it destroys the epidermis. Insects and fish thrown into it immediately die. Plants also perish when watered with it. M. Reichenbach has made experiments with this substance concentrated and diluted, and his success has surpassed his expectations. It has, he alleges, effected a speedy cure in cases of caries, of cancer, and of carcinomatous ulcers.

M. Schweigger-Seidal has made a comparative examination of kreosote, and the aqua Binelli, from which he has come to the conclusion, that the fundamental base of this hemostatic liquor is kreosote, of which it is only an excessively weak solution.

On a New Alcaloid substance called Quinodine, discovered in yellow bark, by MM. Henry et A Delondre. (*Journal de Pharmacie, Novembre* 1833.) —This substance is white, crystallizable in prismatic needles, in the state of a hydrate. It melts into a mass of a resinous appearance, only at a much higher temperature than that required for the fusion of quinine. It is extremely bitter, especially when dissolved in alcohol or an acid. Alcohol of the sp. gr. of .949, or even .963, holds it in solution, but by the spontaneous evaporation of this liquid it is deposited either in crystals, or at first in a sort of resin, which, when moistened by alcoholic water, changes by degrees, on exposure to the air, into beautiful crystalline needles. Cold sulphuric ether dissolves also a small quantity of it. These needles, collected and dried, effloresce in dry air. They speedily turn the syrup of violets green, and restore to its blue colour turnsol paper reddened by an acid.

They combine perfectly with sulphuric, hydrochloric, nitric and acetic acids, to form white pearly salts, very crystallizable like those of quinine and precipitable by soda, &c. The hydrochlorate appears only more needle-like (*aiguillé*) while with quinine it is often in plates like common boric acid. Quinodine at a high temperature is decomposed, diffusing at first an aromatic, then an empyreumatic animalized odour, and a part of the alcaloid is sublimed in the midst of its volatile products.

Its elementary analysis has not yet been determined, but it appears to be rich in azote. It resembles quinine in its form, small degree of volatility, its solubility in alcohol much diluted, and its saline combinations. It differs from this substance by its great tendency to crystallize, and its being less fusible, its being less soluble in sulphuric ether, and by the property which it has in its resinous state of assuming in the air, the form of crystals when moistened with alcoholic water,—an effect which its discoverers have not observed to occur with pure quinine.

Quinodine is found in the yellowish waters which float on quinine and cinchonine after the distillation of the alcholic tinctures and the preparation of quinine. It is accompanied by a yellow substance supposed to be an acid.

The discoverers promise hereafter to give the processes for procuring *quinodine* pure.

Statutes of the University of Edinburgh, relative to the Degree of M. D. 1833.—Sect. I. No one shall be admitted to the Examinations for the Degree of Doctor of Medicine who has not been engaged in Medical Study for four years, during at least six months of each, either in the University of Edinburgh, or in some other University where the Degree of M. D. is given; unless, in addition to three *Anni Medici* in an University, he has attended, during at least six winter months, the Medical or Surgical Practice of a General Hospital, which accommodates at least eighty patients, and during the same period a course of Practical Anatomy; in which case three years of University study will be admitted.

Sect. II. No one shall be admitted to the Examinations for the Degree of Doctor, who has not given sufficient evidence,—

1. That he has studied, once at least, each of the following departments of Medical Science, under Professors of Medicine in this or in some other University, as already defined, viz.

Anatomy,	During Courses of Six Months.
Chemistry,	
Materia Medica and Pharmacy,	
Institutes of Medicine,	
Practice of Medicine,	
Surgery,	
Midwifery, and the Diseases peculiar to Women and Children,	
General Pathology,	
Practical Anatomy (unless it has been attended in the year of extra-academical Study allowed by Sect. 1.),	
Clinical Medicine, that is, the Treatment of Patients in a Public Hospital, under a Professor of Medicine, by whom Lectures on the Cases are given,	During Courses of Six Months, or two Courses of Three Months.
Clinical Surgery,	During Courses of at least Three Months.
Medical Jurisprudence,	
Botany,	
Natural History, including Zoology,	

2. That in each year of his Academical Studies in Medicine, he has attended at least two of the Six Months' Courses of Lectures above specified, or one of these and two of the Three Months' Courses.

3. That, besides the Course of Clinical Medicine already prescribed, he has attended, for at least six months of another year, the Medical or Surgical Practice of a General Hospital, either at Edinburgh or elsewhere, which accommodates not fewer than eighty patients.

4. That he has attended for at least six months, by Apprenticeship or otherwise, the Art of Compounding and Dispensing Drugs at the Laboratory of an Hospital, Dispensary, Member of a Surgical College or Faculty, Licentiate of the London or Dublin Society of Apothecaries, or a professional Chemist and Druggist.

5. That he has attended for at least six months, by Apprenticeship or otherwise, the Out-Practice of an Hospital, or the Practice of a Dispensary, or that of a Physician, Surgeon, or Member of the London or Dublin Society of Apothecaries.

Sect. III. No one shall obtain the degree of Doctor who has not studied, in the manner already prescribed, for at least one year previous to his Graduation, in the University of Edinburgh.

Sect. IV. Every Candidate for the degree in Medicine, must deliver, before the 24th of March, of the year in which he proposes to graduate, to the Dean of the Faculty of Medicine:—

First, A Declaration, in his own handwriting, that he is twenty-one years of age, or will be so before the day of Graduation; and that he will not be then under articles of apprenticeship to any Surgeon or other master.

Secondly, A statement of his studies, as well in Literature and Philosophy as in Medicine, accompanied with proper Certificates.

Thirdly, A Medical Dissertation composed by himself, in Latin or English; to be perused by a Professor, and subject to his approval.

Sect. V. Before a Candidate be examined in Medicine, the Medical Faculty shall ascertain, by examination, that he possesses a competent knowledge of the Latin language.

Sect. VI. If the Faculty be satisfied on this point, they shall proceed to examine him, either *viva voce*, or in writing; *first*, on Anatomy, Chemistry, Botany, Institutes of Medicine, and Natural History bearing chiefly on Zoology; and *secondly*, on Materia Medica, Pathology, Practice of Medicine, Surgery, Midwifery, and Medical Jurisprudence.

Sect. VII. Students who profess themselves ready to submit to an examination on the first division of these subjects, at the end of the third year of their studies, shall be admitted to it at that time.

Sect. VIII. If any one, at these private examinations, be found unqualified for the Degree, he must study for another year two of the subjects prescribed in Section II., under Professors of Medicine, in this or in some other University, as above defined, before he can be admitted to another examination.

Sect. IX. Should he be approved of, he will be allowed, but not required, to print his Thesis; and, if printed, forty copies of it must be delivered before the 25th day of July to the Dean of the Medical Faculty.

Sect. X. If the Candidate have satisfied the Medical Faculty, the Dean shall lay the proceedings before the Senatus Academicus, by whose authority the Candidate shall be summoned, on the 31st of July, to defend his Thesis; and, finally, if the Senate think fit, he shall be admitted, on the first lawful day of August, to the Degree of Doctor.

Sect. XI. The Senatus Academicus, on the day here appointed, shall assemble at 10 o'clock A. M. for the purpose of conferring the Degree; and no Candidate, unless a sufficient reason be assigned, shall absent himself, on pain of being refused his Degree for that year.

Sect. XII. Candidates for Graduation shall be required to produce evidence of their having conformed to those Regulations which were in force at the time they commenced their Medical Studies in a University.*

James Syme, Prof. of Clinical Surgery, Dean of Faculty of Medicine.
W. Hamilton, Secretary to the Senatus Academicus.

The general views with which alterations in the course of study for the degree of M. D. in this University have been at different times proposed in the University, and the difficulties attending the subject, have been repeatedly stated in this Journal, particularly in the long paper on Medical Education by the late Dr Duncan, in Vols. xxvii. and xxviii.

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* Candidates who commenced their University studies before 1825 will be exempted from the fourth year of attendance (Sect. I.), from the additional Hospital attendance (Sect. II. art. 3.), from the necessity of a year's study in Edinburgh (Sect. III.), and from any attendance on

Clinical Surgery,
Medical Jurisprudence,
Natural History,
Military Surgery,
Practical Anatomy,
Pathology, and
Surgery distinct from Anatomy.

Those who commenced between 1825 and 1831, will be exempted from attendance on General Pathology, and also on Surgery distinct from Anatomy.

Those who commenced between 1825 and 1833, will be required to attend only two of the following Classes, viz.

Clinical Surgery,
Medical Jurisprudence,
Natural History,
Military Surgery,
Practical Anatomy.

And those who commenced before 1833, will be exempted from the attendance specified in Sect. II. Arts. 4. and 5.

N. B. The attendance on Midwifery in an University (Sect. II. Art. 1.) is required of all Candidates.

It was there distinctly pointed out, that, in a country where no general regulations for medical education are made by the State, and no monopoly of any kind of practice is granted to the possessors of the medical degree, changes of this kind, in order to become real improvements, must be cautiously and gradually introduced; that such an extension of the course of study as might deter many young men from aspiring to the degree, could neither be expected from the University, nor be beneficial to the public,—because its effect would be to swell the numbers of medical men practising on the inferior degrees, and contenting themselves with an inferior education, and to lower, instead of raising, the average attainments of the profession; but that, on the other hand, in so far as additions to those attainments, which are useful and creditable to medical men, could be secured in the graduates without any material diminution of their numbers, a clear and important advantage would be obtained for the public; and that any University which neglects the means in its power for obtaining this advantage, neglects one of its obvious and important duties.

At the time of the alteration of the statutes in 1825, the Professors were convinced, that the course prescribed for the degree,—then comprising only three winters of medical study, hospital attendance during one of these, and attendance on seven classes,—might be safely and beneficially extended; and in proof of this it was observed, that "*the course of study then prescribed was much short of the usual practice of the candidates*;—that, therefore, to the great majority of these gentlemen, the possession of a degree granted under such rules did not mark, so strongly as it ought to do, the amount of time and labour which they had bestowed in qualifying themselves for it; and that to a certain number, fortunately comparatively small, who did not voluntarily make up for the deficiency in the prescribed course of study, an undue encouragement was held out, to aspire to the highest honours in medicine, without such a degree of preparation as, at the present day, ought to precede the acquisition of them;—that, in fairness to the students, therefore, as well as from a regard to the character of the medical school, and the interests of the public, it seemed manifestly expedient, and was accordingly the decided wish of the profession, that the course of study required by the University should correspond more nearly to that which *the practice of the best informed students had shown to be necessary* for a complete medical education." *

That the Professors had judged correctly in their anticipation of the effect of the change then made, appears undeniably from this fact. The alterations then made comprehended, excepting in certain cases of rare occurrence, an additional year of study, and in all cases attendance on three additional classes, and on an hospital for double the time formerly required. Now, after these regulations had come into full operation, the number of candidates for graduation was found, on an average of five years, to be almost exactly the same as in the last five years before they had been proposed.

Dr Duncan announced, in the paper formerly quoted, that, if the results of the previous changes should prove as satisfactory as was expected, other improvements were contemplated by the Professors.

In the year 1831, another addition was made to the course of study, in consequence of the institution of two new Professorships (those of General Pathology and of Surgery) by the Crown, and of a subsequent act of the Town-Council. Of the propriety of requiring a full and separate course of the latter subject at least, after a distinct professorship of it existed in the University, no doubt could be entertained.

The alterations made by the statutes now published are, in fact, to a less extent than those made, either by the statutes published in 1825, or by the addition of new chairs to the Faculty in 1831; but they complete the amount of medical attendance in universities which has been in contemplation; and they have been mainly grounded, like the changes in 1825, simply on the careful observation of the actual practice of the great majority of the successful candidates; and, therefore, in fact, enjoin no more than experience has already proved to be within their reach, and to be practically important to them.

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* Vol. xxiii. p. 425.

By the first article of the new statutes, two of the exceptions to the four years of university medical study, formerly admitted, but very seldom claimed, are struck off; and the only exception to that rule now admitted is attendance during a winter, distinct from the years of university attendance, on a general hospital, and at the same time on a dissecting-room, not necessarily connected with a University. This provision limits the privilege of aiding the qualification for the degree to those hospitals where there are schools of medicine; but allows one *annus medicus* to be constituted wherever the student has an opportunity of prosecuting those two essential branches of his education together.

By the second article, what has usually been called the list of optional classes is abolished. Military Surgery (as is fitting in a period of profound peace) disappears from the statutes. Practical Anatomy in a University is made imperative on those who do not avail themselves of the permission to take this branch of their education in the year of extra academical study already allowed; and three months' courses of Clinical Surgery, of Medical Jurisprudence, and of Natural History, including, and of course chiefly consisting, of Zoology, are made imperative. Thus, instead of being required to select two courses out of five, the candidate has four courses prescribed for him; and the addition consists of two three months' courses; but, in the very common case, where a winter is spent in hospital attendance, with Practical Anatomy, in an extra academical school,—it consists of one three months' course only.

Of the three last-mentioned classes, the two first were previously required of that large portion of the Edinburgh graduates who take likewise the diploma of surgeon in Edinburgh. The addition of the Clinical Surgery was strongly urged on the Senatus by many most respectable members of the profession in 1825; and the chief reason then stated against it (the want of Clinical Surgical Wards in the Infirmary) has since been removed by an Act of the Managers. Medical Jurisprudence has become so important a study, and is required by so many of the inferior boards of medical education, that its exclusion from the course of study, in a University where it is so well taught, would have been discreditable; and Zoology and Comparative Anatomy have now assumed such importance in general science, and are so generally admitted to form the only true foundation of a comprehensive system of physiology, that no course of medical education can be held to be complete or scientific, which does not comprehend at least an outline of those subjects. The full course of Natural History is already attended by a majority of the Graduates.

The whole number of courses of study thus prescribed is fourteen; and the books of the Faculty show, that the average number of courses which have been actually attended by each candidate for graduation of the two last years has been about twenty. This statement shows that the "members of the University are still aware of the advantages which medical students derive from various extra academical studies, and of the propriety of leaving room for them in the arrangement of the course they prescribe;" although, the addition to the number of medical chairs in the University has rendered it less necessary than formerly to make this allowance.

The 4th and 5th articles of the new statutes may be said to be a virtual recognition of apprenticeship, as assisting the qualification for the degree; and to those who have not been apprentices, (and who are at present only a minority of the graduates,) point out the means of attaining the most valuable parts of the information,—particularly as to the practice of pharmacy, and as to certain classes of diseases (such as those of children) rarely seen in hospitals,—which are to be learnt by means of apprenticeship. *These regulations only express in words the actual practice of the great majority of the late candidates for graduation.* Of 110 graduates this year, 102 had voluntarily acted up to the first of these, and 86 to the second; and one great advantage of their enactment is, that it will enable the University to claim for all the graduates (it is hoped successfully) the privilege of acting as general practitioners in any part of the united kingdom, where it may suit their interest to do so.

On the whole, it is particularly to be observed, that the propriety of these new regulations does not rest on merely speculative grounds, but may be said to have been already ascertained by the practice of all the best informed of the graduates for some years past; whose whole course of study and attainments have been under the careful observation of the Professors; and of whom it is but justice to say, that, if they are not eminently worthy of the confidence of the public, it must be very much the fault of their teachers; for their own zeal, diligence, and disposition to avail themselves of all opportunities of instruction, have certainly not been exceeded in any age, or in any school of medicine.

To the Honourable the Commons of the united kingdom of Great Britain and Ireland in Parliament assembled, the Petition of the undersigned Physicians, practising in London,

Humbly Sheweth,—That the charter of the Royal College of Physicians of London was granted by Henry the Eighth, for the advancement of medical science, and for the protection of the public "against the temerity of wicked men, and the practice of the ignorant."

That six physicians were named in the charter, who, together with all men of the same faculty, then resident in London, were constituted one body, commonalty, or perpetual College.

That the perpetuity of the college was to be kept up by the future admission of all men of the same faculty into the college.

That several of the six physicians named in the charter, studied at, and possessed degrees from, foreign universities; and that no distinction is mentioned, as regards the university where a physician may have obtained his degree.

That all physicians entitled to practice in London are equally entitled, under the charter, to admission to the fellowship of the college.

Your petitioners are prepared to show, that bye-laws have been framed, and long acted upon, by the college, which are directly opposed to, and in violation of, the letter and meaning of the said charter.

That the physicians practising in London are invidiously divided, by the bye-laws of the college, into two orders: one is denominated fellows; the other, constituting by far the majority, is designated (and by implication degraded) by the term licentiates.

That the fellows have usurped all the corporate power, offices, privileges, and emoluments, attached to the college; that the licentiates do not participate in these benefits, but are illegally excluded from all the offices, and any share in the management of the corporation; and so far is this principle of exclusion carried, that the licentiates are not even admitted to the library or museum of the college.

That there exists no foundation in the charter, or in the acts confirming it, for such distinction of orders, and consequent exclusion from all privileges.

That, according to one of the bye-laws, no physician can claim admission as a fellow, unless he has graduated, or been admitted *ad eundem* at the Universities of Oxford or Cambridge, where medicine is imperfectly taught;

while physicians who have graduated at other British or foreign universities, celebrated as schools of medicine, are unjustly excluded from the fellowship, by this obnoxious bye-law.

That the college was admonished from the bench, by the Lord Chief Justice Mansfield, to amend their bye-laws, in reference to the admission of licentiates into the fellowship: that influenced by this censure, the college framed other bye-laws, deceptive in their character, which, whenever they have been acted upon, have tended still further to depress and injure the order of licentiates.

That the college demand and receive a large sum of money from the fellows and licentiates, for the supposed privilege of practising as physicians, within a circuit of seven miles round London, and that they do not and cannot protect them in this privilege.

That the graduates of Oxford and Cambridge are obliged to be members of the established church of England, and, consequently, all dissenters are excluded from claiming the fellowship: this your petitioners consider as a grievous injustice, and an act of intolerance unbecoming the present age.

That these invidious bye-laws, made in the spirit of corporate monopoly, have involved the college in continued litigation, and created a jealousy between the fellows and licentiates discreditable to the members of a liberal profession.

That your petitioners, with deference, submit, that the College of Physicians, as at present constituted, is wholly inadequate to the due regulation of the medical profession in this country, and the protection of the public;—and further, that the charter of the college in no way provides for the practice of physicians in the several counties of England and Wales. Confiding in the wisdom of Parliament, your petitioners therefore pray, that your Honourable House will institute such inquiry into the state of the medical profession in this country, and the College of Physicians in particular, as will lead to the framing of laws, by which the evils complained of may be removed. And your petitioners will ever pray, &c.

Gilbert Blane.
Henry Clutterbuck.
George Birkbeck.
W. Somerville.
Alexander Morison.
Thomas Brown.
Alexander Henderson.
Charles F. Forbes.
Charles Locock.
Neil Arnott.
Roderick Macleod.
John Vetch.
W. Gairdner.
William Russell.
Hugh Ley.
James Clark.
Robert Lee.
Marshall Hall.
William Whymper.
Thomas Hodgkin.
C. J. B. Williams.
Alexander Tweedie.
Henry Davies.
J. W. Crane.
Theodore Gordon.
Whitlock Nicholl.
A. T. Thomson.
John Sims.
James Copland.
George Gregory.
J. C. Somerville.
James Bartlet.
John Webster.
Thomas H. Burder.
Thomas Davies.
T. Southwood Smith.
David Barry.
Charles Holland.
John Foley.
Francis Boot.
R. M. Kerrison.
C. J. Roberts.
William Stroud.
James Johnson.
Edward Rigby.
Robert Richardson
G. G. Sigmond.
James. Hope.
A. T. Holroyd.

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PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Report of the Cases treated during the Course of Clinical Lectures delivered at the Royal Infirmary in the Session* 1832–1833. By DAVID CRAIGIE, M.D., F.R.S.E., Fellow of the Royal College of Physicians, Edinburgh, Physician in Ordinary to the Royal Infirmary, and Lecturer on the Practice of Physic. (Published by permission of the Honourable Board of Managers.)

(*Concluded from p.* 127.)

IN the present Report, I shall fulfil the promise which I made in the commencement of the last, by taking a general view of those cases of disease which it was then impracticable to introduce in a satisfactory manner. These, it may be remembered, were principally the numerous and long list of cases of Continued Fever (*Synochus* and *Typhus;*) but this circumstance will require me to advert rather particularly to two forms of disorder, either accompanying or following the febrile process. These are Pneumonia and Erysipelas.

The cases of fever, it will be observed, are exceedingly numerous; and indeed this is a disease which is at all times very prevalent during cold wet weather in winter among the lower ranks in Edinburgh. It would be tedious, and not very profitable, were I to give an account of the characters of a disease which has been so often described as Continued Fever, and I must, in so doing, repeat many observations made either by others or myself. There are, however, certain points which I conceive may be with propriety brought under notice in the present sketch, either as illustrating the peculiar nature of the fever of Edinburgh, or as tending to elucidate the pathology and treatment of fever generally.

I. SEMEIOGRAPHICAL CHARACTERS OF FEVER, AS PREVALENT IN EDINBURGH.—The cases of fever most common during the winter of 1832, 1833, principally presented the usual symptoms of *Synochus*. They commenced very generally with sensations of cold or shivering, and general languor and feebleness, speedily followed by heat, thirst, pain or weight of the head, pains of the back and limbs, and general feebleness of all the voluntary motions. The pain or weight of the head was very generally attended with more or less injection and suffusion of the eyes, distension and throbbing of the temporal artery, heat of the scalp, and flushing, or at least occasional flushes of the face.

At the same time the respiration was more or less oppressed, inspiration not full or extensive, and more rapidly followed by expiration than in the state of health; the action of the heart was labouring, more or less jarring, and stronger than natural, and giving to the arteries a hard throbbing rapid beat, quickly following in succession.

The epigastric and umbilical regions were generally more or less tense, tender, painful, and uneasy; the bowels were not easily affected by purgatives; and where sensation was still preserved, the patients complained of pains, wandering or fixed, in the lower part of the chest, in the hypochondriac region, and in the epigastric and umbilical regions.

After these symptoms had continued for five, seven, or nine days, they either began to abate and recede, and the pulse becoming less frequent, the tongue cleaner, the bowels more easily acted on by purgatives, and the urine more copious, the usual sensations of returning healthy function began to appear;—or the patients complained less, and slowly or quickly sunk into a state in which imperfect circulation, interrupted secretion, and impaired sensibility were the leading and obvious symptoms. Though the tongue was dry, and even glazed, the patient ceased to complain of thirst; light and sound were no longer irksome; the pain and tenderness of the epigastric and umbilical regions were gone, though these parts were as tense as ever; he had no uneasiness, and when interrogated how he felt, replied that he was quite well. In this state the pulse was from 90 to 110, or 120, small, and rather oppressed; the respiration was about 28 or 30, often with some cough and slight mucous rattling, and always with limited inspiration; the countenance was dingy-coloured, the eye dull, and less suffused, but muddy; and the skin dry and cold, or greasy, and partially moistened.

The intellectual functions were at the same time much impaired. Either they were completely obliterated, so that the individual continued in a state of stupor, without consciousness and sensibility, or recollection was confused, so that he forgot where he was, and continued muttering incoherently, with a semi-stupid state during the whole time. This state, constituting *typhomania*, sometimes lasted for three, four, or five days; and though the patient muttered and spoke often inarticulately the whole time, and never slept, he had, upon recovery from this state, no recollection either of his thoughts, his sensations, or his condition. It terminated in one of two modes. Either after continuing for 36, or 48, or 60 hours, the muttering gradually abated, while the skin became warmer and moist; the pulse, which had been previously small and oppressed, became softer, fuller, and less frequent; the eye became less suffused and clearer; and the patient, becoming less restless, began to sleep at intervals;—or the muttering seeming to disappear, the stupor became more intense, and gradually passing into coma, more or less perfect, with sero-mucous rattling in the bronchial tubes and windpipe, death ensued in the course of twelve hours more.

In the assembled train of symptoms now enumerated, it is easy to recognise the general circumstance of great distension of the capillary vessels of all the tissues and organs at the commencement, tending to interruption of the circulation and secretion of these organs, and consequent interruption of the proper functions of the organs towards the termination. The first state corresponds to the symptoms referred to *Synocha* by Cullen, the second to those referred to *Typhus;* and the whole evidently accord with the characters assigned to *Synochus* by the same nosologist.

Though the form and degree of the symptoms now enumerated constituted the most frequent form of fever witnessed in the cases admitted into the Infirmary during the season of 1832, 1833, they were nevertheless liable to considerable variations.

In about forty instances, with the appearance of the symptoms evincing capillary distension and dynamic oppression, the surface presented *stigmata* and *petechiae* more or less thickly diffused over the person. Violet or livid stripes or *vibices*, however, were not very common, and they appeared in not more than two or three cases. In one patient, John Boyle, æt. 35, the skin and cartilages forming the apex of the nose assumed a livid purple colour, which continued till death; and in one, William M'Leod, the middle finger and part of the ring-finger and hand, presented the day after admission the whole skin of a deep violet livid colour.

The skin over the sacrum presented two varieties of morbid action. The one was a superficial inflammation, (*erythema tripsis; erythema paratrimma,*) arising partly from pressure, partly from the irritation of the urine and feces, in some cases not removing with sufficient promptitude, and producing detachment of the cuticle, and superficial ulceration or partial superficial sloughs. The other was a sort of death almost direct of a portion of the skin, which very quickly, without previous redness or swelling, exhibited the dark-gray or brown appearance, hard consistence, and insensible characters of a mortified slough more or less extensive, much as if it had been cauterized by a hot iron or live-coal, or a piece of caustic potass. This very soon, if the patient recovered, began to be detached by means of ulceration from the surrounding sound skin; and when it was separated either partially or entirely, it was seen that a large portion of the subjacent cellular tissue had been killed, and was lying beneath the dead skin in the form of a loose flabby gray-coloured insensible mass. In general, the cellular tissue was killed more extensively than the skin; for it was observed that the deep-seated slough extended much beyond the limits of the cutaneous one, so that the skin was much undermined. From this circumstance, I am inclined to believe that in fever the cellular tissue of the sacrum is killed by mere pressure, combined with the state of the vessels, long before the skin is killed; and that the complete death of the latter in the sudden manner in which it takes place in fever, without previous inflammation, is the consequence of the previous death of the cellular tissue.

Attacks of *erysipelas* of the head and face were very frequent, sometimes during the course of the febrile process, more frequently after its completion. In the latter case, it was very generally observed to succeed the application of a blister to the scalp, or even the punctures produced by the application of leeches.

In one instance, not in the Hospital, I saw not only erysipelas affecting the scalp in a slight degree, but a rather troublesome attack of the rose-rash (*roseola*) over the greater part of the person, giving great temporary alarm to the patient and his attendants. The eruption, however, ran its course under the use of purgatives, and the local application of the camphorated chalk powder; and the case terminated favourably.

In describing the foregoing variety of fever, I must observe, also, that in several instances the symptoms of capillary injection and distension passed in so short a time to those of interruption of circulation and suspension of dynamic properties, that the former class of phenomena were scarcely observed, while the latter, appearing early in an intense and virulent form, and continuing during the whole course of the disease, gave, or seemed to give, the fever its predominant character of oppression of the circulation, and suspension or extinction of the functions of most of the vital organs. It was not then a mere oppression of the nervous system which distinguished the termination of the disease; for though the brain and spinal chord were certainly affected, the symptoms did not indicate a greater affection of these parts than of the lungs, the stomach and intestinal tube, the liver, and the other secreting glands, and even of the skin and mucous surfaces. The termination of the disease, in short, was in these cases distinguished by a mortal oppression of the circulation, especially, of all the organs, and a consequent subversion or extinction of their functions. To this subject, however, I shall advert more fully when speaking of the pathology of fever.

One form of fever, however, I have still to mention as very frequent during the winter season in Edinburgh. I allude to its complication with, or its dependence upon, inflammation of the bronchial membrane, or pulmonic tissue, or both.

In the winter season, it is not uncommon for fever in many patients to betray a peculiar tendency to affect the bronchial membrane or lungs. In such persons the symptoms of fever (*Synochus*) are accompanied with respiration from about 30 to 32 in the minute, short, laborious, and inefficient inspiration, frequent cough, with expectoration, more or less copious, of viscid jelly-like mucus, which has very frequently an orange-coloured tinge, passing to rusty-brown, with a sense of weight and constriction in some part of the chest, small quick pulse, flushed and sometimes livescent countenance; one or both sides of the chest sounds dull upon percussion in the centre, and auscultation indicates some times the mucous rattle, some times the sibilous, and occasionally the crepitous or subcrepitous. In two instances, Simon Cahill and John Adamson, I heard the sonorous rattle for two days; but as this was unattended with very oppressive symptoms of pulmonic oppression, I am uncertain whether it is to be regarded as a constant sign, or as indicating rather a lesion of old standing, as it does in chronic *bronchitis*.

This complication of *Synochus* assumes different characters in the young and vigorous, and in the old and enfeebled. Though in both it differs very much from *bronchitis* and peripneumony without fever, and presents always fewer of the symptoms of *Synocha*, and more of those believed to characterize *Typhus*, in the latter class of patients, however, it appears in the form of a low, oppressed, and almost latent disorder of the lungs, which is very liable to escape notice. The general sensations of the patient are then so obliterated by the oppressive action of the fever, and the particular sensibilities of the lung and bronchial membrane are so much impaired, that they fail to give the usual distinct indications of disordered breathing, and the patient makes much less complaint than in ordinary bronchial or pneumonic inflammation.

In the young and vigorous, indeed, the pneumonic or bronchial complication of fever betrays its existence by pretty frequent hard ringing cough, and more or less copious expectoration of the kind above-mentioned, because the muscles of the chest possess still power to react upon the irritated bronchial membrane or pulmonic tissue. But in the aged and feeble the power of coughing is often entirely extinct, and the disordered respiration is indicated chiefly by the low oppressed breathing already-mentioned, livescent or livid countenance, dulness in the centre of the chest upon percussion, subcrepitous rattle, and tracheo-bronchial rattling previous to death.

From various circumstances, which will appear in the subsequent course of these observations, I think it may be inferred, that the exquisite or intense form of these pneumo-bronchial symptoms in fever is determined by the previous existence of a lesion of the lungs or bronchial membrane.

This complication of *synochus* is the disease which has been described by Cappel and others under the name of *Pneumonia Typhodes*.

It is remarkable that it has been repeatedly misunderstood or overlooked in this country, chiefly by practitioners, looking too much to the colour of the expectorated mucus, and which they erroneously ascribed to the presence of bile in the system. The orange or rusty-brown colour, however, depends not upon the presence of bile, but on the decomposed blood which exudes from the capillaries of the bronchial mucous membrane. As the capillaries of that membrane, and of the pulmonic tissue, are very much distended with slowly moving, and almost stagnating blood, that fluid is liable to become decomposed, and its red part to exude, and, consequently, tinge the mucus, which thus becomes, according to the quantity of colouring matter blended with it, orange-coloured, of a rusty-brown colour, reddish, or streaked with actual particles of blood.

In confirmation of the accuracy of the explanation now given, I may observe, that in the process of recovery the first step is the disappearance of the streaks of blood or reddish colour of the expectorated matter; the next, the brown or orange-coloured tint diminishing in intensity; the next, a sort of pale yellow tint in the expectorated matter; and the last, the transition of the latter to the usual white mucus of subsiding *bronchitis.* It is further to be remarked, that in fatal cases of this disease the upper bronchial tubes are found to contain a considerable quantity of viscid mucus, brownish-coloured, or tinged with blood, and the more remote and the pulmonary vesicles contain blood-stained mucus; while the submucous and pulmonic filamentous tissue is loaded with blood-coloured frothy serum.

II. MORBID ANATOMY OF CONTINUED FEVER.—During the course of the season, extending from the 8th October 1832 to the 29th September 1833, the state of the internal organs in the bodies of eight persons were carefully inspected after death; and if I include those of the Clinical Physicians or my colleagues, the inspection of which I conducted, I may say there were at least eight more; and the appearances recognized were of two kinds; *first,* those essential to the febrile process, and more or less constant; and *secondly,* those which evidently had preceded the febrile process had pre-existed in the various tissues, and which consequently were to be regarded as not essential to that process, but which, nevertheless, exercised a remarkable influence over it. As both of these classes of morbid phenomena accord very accurately with those which I recognized in the dissection of a considerable number of the bodies of persons cut off by fever in the years 1817, 1818, 1819, and 1820, in the Royal Infirmary, and in the Fever Institution at Queensberry House, when I occupied the situation of house-surgeon to the former institution, I think it will render the description now to be given, and the inferences thence deduced, much more complete, if I combine both, so as to form a uniform and general delineation.

The state of the different organic tissues in the bodies of persons destroyed by fever varies according to the duration of the disease, and according to the character of the external symptoms The following may be regarded as most uniform appearances.

When the upper division of the scull was removed, the cerebral membranes were observed to present large blood-vessels, more or less distended with dark-coloured coagulated, or partially coagulated blood. These vessels were largest and most numerous on each side of the longitudinal sinus, especially towards its posterior end. Upon examination, these proved to be chiefly veins. But it was remarkable that the divisions of the internal carotid artery, and the basilar artery, at the base of the brain, were equally distended with dark-coloured blood; and even the Sylvian and callous arteries, and their minutest ramifications, were found distended with dark-coloured semi-coagulated blood. Even the meningeal artery contained blood of the same characters; so that the arteries were in an equal, if not in a greater degree, distended than the veins.

When the *dura mater* was divided and detached, in general, a gush of limpid thin fluid, mixed with blood, issued from the upper end of the spinal chord. When this was examined, it was found that the thin fluid escaped from the membranes of the spinal chord chiefly, while the blood proceeded from veins and arteries divided in cutting across the upper end or bulb of the chord.

The subarachnoid filamentous tissue was extensively infiltrated with limpid serous fluid, which was always most abundant in the parts corresponding to the *sulci* of the convoluted surface, and gave the membrane an opaque thickened appearance. Occasionally, also, it was very abundant in the vicinity of large vessels; and it was in intense cases in which death had been preceded by *typhomania* lasting for days, or stupor for twelve or twenty hours, diffused very generally through the subarachnoid filamentous tissue, so as to give that membrane the appearance of being raised from the *pia mater* by the interposition of a jelly-like matter. Upon making punctures, however, in the arachnoid membrane, and detaching it by the forceps, it was evident that the infiltrated matter was not jelly but serous fluid.

The consistence of the brain varied; but it was in general firm when inspected within fifteen, eighteen, or even thirty hours after death. In cases in which death had taken place before the 21st day, its substance was uniformly traversed by numerous red vessels, which were larger than in the state of health. When the organ was divided into slices, each slice presented numerous red points and fissures, varying in size, arising from the transverse division of these vessels. In some instances these were so numerous in the white matter of the hemispheres above the ventricles as to give it a reddish tint; and in the unciform band and capsule of Reil, they were always large and numerous, and in some instances attended with reddish softening of the contiguous cerebral matter.

The choroid *plexus* was always unusually crowded with red distended vessels, was in some instances brown or dark-coloured; and occasionally large canals, filled with dark-coloured half-coagulated blood, might be traced passing from that web into the gray-white substance of the optic eminences *(thalami optici)*; and almost invariably large vessels containing dark-coloured fluid blood were observed in the epithelion of these eminences, and of the figurate surface of the brain generally, and especially near the course of the semicircular band *(centrum semicirculare geminum; tænia semicircularis.)*

A quantity of fluid, limpid or turbid, of a faint red or blood-colour, was generally found in the cavities formed by the figurate surface, viz. the ventricles; but the quantity of this fluid seldom bore any constant relation to the mode of death, or the circumstance of previous long-continued coma. I have related in the Clinical Reports of Dr Duncan, one case (Burns) in which, though the febrile symptoms had never been attended with either deep or lasting *coma*, but had chiefly been marked by a sort of lethargic stupor, and had on their subsidence left still some degree of heaviness enduring for about two weeks, a considerable quantity of serous fluid was found in the cavities, and the middle partition (*septum lucidum*) was attenuated, perforated, and broken down. This result, however, occurs chiefly in cases in which the diseased action has not been sufficiently intense to extinguish life in the first three weeks, and where, consequently, the distension produced by the mechanical pressure of the effused fluid injures the delicate parts of the brain. Conversely, in several cases in which *typhomania* had continued for days, and death had been preceded by *coma*, a very small quantity only, or no serous fluid, was found in the ventricles. In the case of the man M'Growther, though the vessels of the *pia mater*, and even the substance of the brain, were distended with dark-coloured blood, not much serum was found in the ventricles.

The *cerebellum* was also much redder than natural, and its *pia mater*, especially where it penetrates between the cerebellic plates, was very vascular, and the vessels were loaded with dark-coloured blood. In general, I have also observed that the gray matter of the cerebellic plates was unusually vascular, emitting drops of semifluid blood when divided, and that the *corpus dentatum*, both of the *cerebellum* and spinal bulb, was redder and more vascular than natural. In some instances of fever, I have observed these parts of a faint peach-blossom tint with injected blood.

The *pia mater* covering the spinal bulb, the annular protuberance, the *crura cerebri*, and *crura cerebelli*, and, indeed, extending over the whole of the region denominated *base* of the brain, was always very red, and traversed by numerous large vessels containing dark-coloured semifluid blood. In general this part was vascular, and injected in proportion to the degree in which hearing and sensibility generally was impaired, and in proportion to the intensity and duration of the stupor which preceded the fatal event.

I have stated that watery fluid, tinged or mixed with blood, generally escaped from the spinal column at the moment of division of the head of the chord. When this cavity was opened first, fluid was found in general between the lining of the *vertebræ* and the vertebral *pia mater*, but much more abundantly between the latter membrane and the denticulate ligament. The vessels of the spinal *pia mater* were large, especially at the lumbar region, tortuous, much distended with black blood, and greatly more numerous than in the state of health, or in the bodies of those cut off by chronic diseases.

All the appearances now enumerated were observed in an intense and exquisite degree in the case of the man Macgrowther, who died with symptoms of intense petechial typhus. The cerebral and spinal *pia mater* were perfectly crowded with large dark-coloured vessels; the choroid plexus was like a clot of dark coagulated blood; the ventricles contained bloody serum; and even the substance of the brain seemed to be blackened.

The lungs were generally very dark-coloured, much gorged with black blood, and their substance much infiltrated with bloody serum, and clots of dark-coloured blood were found in the large vessels. The trunk and branches of the pulmonary artery always contained dark-coloured semi-coagulated blood, and most of the smaller vessels of the lungs were much distended with a sort of very dark-coloured viscid gore. The bronchial tubes were generally filled with much viscid sero-mucous fluid, which in several cases was slightly tinged with blood. In all, the bronchial membrane was reddened or embrowned, and the submucous tissue was more or less infiltrated with blood-coloured serum.

In a few cases which I inspected during 1820 and 1821, I have elsewhere stated that numerous minute abscesses, about the size of a pea, were found disseminated through the lungs, yet without accompanying tubercles. I believe that what I had then regarded as minute abscesses, were sections of the small bronchial extremities and pulmonic vesicles, loaded with puriform mucus, or fluid secreted by the inflamed bronchial membrane. At all events, I have observed this appearance since in a few cases, which I think were similar to those which I then regarded as examples of minute isolated abscesses.

In the case of William Wilson, æt. 53, the pulmonic tissue was extensively indurated, and part of the right lung was infiltrated with foul gray-coloured purulent fluid. The case of Cookson has been described in last Report. In that of Weir, the whole of the centre and external convex surface of the left lung was indurated into a solid resisting mass, in which the original distinction of the lung into lobules could be distinctly seen and recognized. In the case of Macgrowther, who died with symptoms of intense *Typhus* and great dynamic oppression of all the organs, the lungs were dense, firm, and uncrepitating, of a deep black colour, and their intimate substance was so much infiltrated with bloody fluid, and their vessels so much loaded with blood, that it resembled rather a mass of dark clotted blood than a piece of lung.

The cavities of the *pleurae* contained a small quantity of bloody serum, varying in general from ten to twenty ounces.

The heart was in general somewhat enlarged; and when this was considered, it was found to depend on distension of its chambers, especially the ventricles, by masses of grumous or semicoagulated blood, as dark in the left as in the right ventricle. In some instances these were mixed with bells of air. The pericardium, in a few instances, contained serous fluid. In that of Macgrowther, this fluid was of a bloody tint.

The peritoneum was in general in a natural state, unless that it contained, in a few instances, a little serous fluid. In others it presented occasionally patches of redness, or brownish-redness, or greenish-brown, arborescent or asteroid, which were evidently derived from vessels in the subserous tissue. The most usual appearance, indeed, was for this membrane to present dark-coloured arborescent streaks, which, if the stomach or intestines were held up between the eye and the light, were seen to depend on injection or distension of the arteries with dark-coloured blood. In those fatal cases in which the symptoms had been obscure, or indicated dynamic oppression, the lustre or brilliancy of the membrane was generally impaired, and it was slightly covered with streaks or thin layers .of a ropy glutinous sort of semifluid covering.

The state of the mucous membrane of the stomach and intestinal tube varied according to the administration and effects of purgative or other medicines. In most instances the gastric mucous membrane was covered by viscid mucus, upon the removal of which the membrane was observed to be thickened, often reddened, sometimes softened. In cases in which the stomach was much contracted, the rugæ were large and rather reddened. The membrane itself was not unfrequently marbled. The vessels of the submucous tissue were always very large, and contained much dark-coloured semifluid blood. The duodenal mucous membrane was in general irregular, and sometimes vascular, at the mucous follicles of that bowel.

The trunks and branches of the gastro-hepatic and gastro-epiploic arteries were distended with much dark-coloured blood, which was either grumous and half-coagulated, or semifluid and loose, with disruption of its fibrin.

The intestinal mucous membrane was still more frequently affected. In general it was loaded with much viscid adherent mucus, upon the removal of which the membrane was found thickened, vascular, injected, and occasionally reddened. When examined between the eye and the light, the ramifications of the mesenteric arteries were observed to be filled by much dark-coloured blood, which might be traced backwards into the large branches or trunks, in which it was observed to be grumous, and loose or broken in its fibrinous portion. The membrane itself was occasionally softened, and presented sometimes appearances of abrasion. In 1818, several of the cases presented dark-red petechial spots of the intestinal mucous membrane; and in a woman named Finnie, these were large and distinct over the whole tract of the intestine. In the cases under treatment in 1832 and 1833, we were unfortunate in not obtaining permission to inspect any of the strongly-marked petechial cases, except that of John Boyle, in whose colic mucous membrane were found numerous minute oval ulcerations along its whole course, from the *caput cæcum* to the *rectum*. These ulcerations appeared to have taken place chiefly, if not entirely, in the mucous follicles of the bowel, in which these follicles are always insulated, and not aggregated in patches as in the ileum. But I do not regard this as either the effect or the cause of the febrile process, but as the consequence of previous disease, and only tending by their presence to give the fever a bad and complicated character, and to diminish the patient's chance of recovery. From the relatives of this man I had also ascertained that he was addicted to the habitual use of spirits, and that he had occasional attacks of *diarrhœa* for nine or ten months previous to that of the Fever which proved fatal.

Affection of the follicles of the intestinal mucous membrane was indeed rarely observed; and in one case only, that of Neil Black, did I find the aggregated follicles more distinctly developed than natural; and in one case only, namely, that of James Brand, æt. 24, were they in a state of actual inflammation and ulceration.

In this man, who was admitted on the 24th of January 1833 in a state verging on stupor, with delirium and incoherent speech, and with no other complaint except that of painful deglutition, much restlessness, with unsteadiness of the muscular motions, ensued on the night of the 27th. On the 28th, *subsultus* took place, the teeth and lips became covered with foul, viscid, sordid mucus, the respiration became short and interrupted, at the rate of 52 in the minute; and, after continuing for some hours in a state of insensibility, death took place on the 30th.

Upon inspection on the 31st, the vessels of the *pia mater* were found minutely injected, but with little subarachnoid effusion. Upon dividing the substance of the brain, numerous points effusing fluid blood appeared. The ventricles were dilated, and contained about three drachms of serous fluid.

The lower portion of the *ileum* presented the agminated glands enlarged, and several of them in patches ulcerated, varying in size from the extent of a split-pea to that of a sixpence, in which the mucous membrane was destroyed, with a sharp elevated edge, while the submucous tissue was in some patches destroyed, and the *peritoneum* exposed, in others merely thickened. Nearer he lower extremity of the *ileum*, some of these patches presented in the centre a firm, leathery, inelastic sort of substance, ike the coriaceous matter of the lichens, but tinged upon the urface with feculent matter. At the lower extremity of the *leum* the patches were more numerous and extensive, and of a deep-red colour. The mucous membrane of the *ileum* was generally reddened, and in various parts elevated by enlarged and varicose vessels. Over the whole of the *ileum*, for about two feet from its lower extremity, the isolated glands were very distinct, and disseminated over the membrane like millet-seeds. In the colon, several of the isolated glands were indurated, elevated, and slightly ulcerated upon their summits.

The disease of the intestinal follicles here described cannot, I am satisfied, be regarded as either the cause of any part of the febrile symptoms, or the effect of the febrile process. The time which is requisite to produce this disease of the follicles is much longer than the ordinary duration of continued fever; and it is impossible to conceive all the changes observed in this case to have taken place within the space of eight or ten days. The coriaceous or fungous covering observed in some of the ulcers is manifestly part of the process of repair; and I had also ascertained from the relatives of this man that, previous to the attack of fever which had proved fatal, he had been liable to occasional attacks of diarrhœa, and other symptoms of disorder of the intestinal mucous membrane.

The kidneys were always more or less changed from the healthy structure. Their most usual appearance was that of a great quantity of dark-coloured semifluid blood in their arterial trunks and branches, with much black dying of their granular matter.

From the foregoing account it results, that in persons cut off by fever, we find not only certain changes peculiar to that disease, but various changes peculiar to various other affections. Thus we recognize distinct traces of *meningitis* in the head, sometimes softening and suppuration of the brain; in the chest traces of bronchitis or pneumonic inflammation of long standing, or both, and sometimes enlargement of the chambers of the heart; in the abdomen, traces of gastric or intestinal congestion, of gastric or intestinal follicular disease; occasionally enlarged or otherwise diseased liver, and not unfrequently diseased kidneys.

In addition to these appearances, however, in the internal organs, I have found various appearances in the skin, the muscles, the filamentous and other tissues, all of which, I conceive, belong more or less accurately to the process characteristic of fever. Thus the muscles were always deeply tinged with very dark-coloured blood, and their vessels were loaded and distended with dark-coloured semifluid blood, which issued from each incision. In the case of the man Macgrowther especially, the muscles of the neck, the chest, the belly, and the back, were almost perfectly blackened with dark-coloured blood, which was not less dark in vessels communicating with arteries than in those communicating with veins.

In order to ascertain something regarding the morbid anatomy of the stripes or livid patches (*vibices*) observed in the virulent forms of malignant fever, I made a slight incision into the skin of the nose of the man Boyle, in whom this part had become livid three days previous to the fatal termination. The incision showed the skin and subjacent cellular tissue to be deeply tinged by dark-coloured extravasated blood, while dark-coloured coagulated blood was contained in the minute vessels.

In another instance I had still more decided evidence of the state of the vessels in these patches in the living body.

A man of the name of M'Leod, aged 35, and who was a habitual drunkard, was admitted on the 1st February, after symptoms of fever of at least ten days' duration, in a state of the most complete dynamic oppression of all the tissues and organs. His extremities were cold and bluish-coloured, the pulse at the wrist imperceptible, and felt only at the bend of the arm to beat feebly at about 120 in the minute. The countenance was of a deep sallow dingy tint; the eyes suffused and muddy; the speech incoherent, and almost inarticulate; the muscular motions exceedingly feeble, and void of precision; the tongue covered with a thick, dry, blackish fur; the scalp hot; the breathing hurried and incomplete; and the belly was somewhat tender and distended.

Under the use of the warm-bath, shaving the head, and the compound calomel bolus, the countenance was clearer the following day, and the skin not worse. During the ensuing night, however, he had been extremely restless, and the delirium was considerably increased, with much stupor; and on the following day, a dark livid or violet-black patch was observed on the ulnar side, the posterior and anterior surface of the middle finger, and spreading partly up the skin of the hand, but of a colour less deep. This discoloured patch, I may add, was bounded by a circumscribed line, but with irregular or ragged edges, and the affected part of the hand was diffusely swelled. The latter circumstance led me to regard it as a form of a gangrene or gangrenous rose (*erysipelas gangrænosum*), and in this belief I made an incision through the skin of the livid patch of the finger down to the *periosteum*, which showed the skin and subjacent tissues to be of a deep crimson and violet-red colour, partly from injected and intra-vascular, but coagulated, partly from extravasated blood. From this deep incision only a few drops of dark-coloured viscid gore issued; a circumstance which indicated that the blood had in these vessels become fixed, stagnant, and decomposed, very nearly in the manner of a local gangrene.

It was extremely unfortunate that we were not permitted to inspect the internal organs of this man, since I entertained no doubt that they would have presented not only extensive previous lesions, and changes of structure, but a very intense degree of the peculiar state of the vessels, which I shall afterwards show takes place in fever. I am inclined, however, to regard the state of the organs exhibited by the man Macgrowther as adequate to supply this deficiency. In order that a connected view of these appearances may be given, I shall shortly state the leading circumstances.

This man, æt. about 38, a person of exceedingly dissolute habits, habitually addicted to the intemperate use of spirits, and reported to obtain his livelihood by the unlawful occupation of disinterment, was admitted on the 2d May, about the seventh or eighth day of fever, with symptoms indicating great dynamic oppression of all the organs. His countenance and person were of a dirty leaden hue, his eye was suffused and muddy, the tongue was tremulous, and covered with a dark viscid fur; the muscular motions were almost entirely extinct; he had constant *subsultus tendinum* and *typhomania,* in which, however, stupor was more predominant than delirium; the pulse was about 88, very feeble, and small, and the respiration about 46, irregular, and incomplete. On the following day, with these symptoms, it was observed that there were occasional convulsive twitches of the face, puffing motion of the mouth and lips, with incapacity of swallowing, and constant *subsultus,* while little or no urine had been discharged, and the bowels had not been moved;—all symptoms indicating not only oppression of the brain and spinal chord by over-distension of its vessels, but great insensibility and *inertia* of all the organs. That night, with the typhomaniacal muttering, the insensibility was rather increased; the pulse was 84, extremely small, while the respiration was 52, chiefly performed by the diaphragm, and very laborious. An *enema* administered the previous evening had produced no stool, and no urine was discharged. Death took place in the course of the day.

On the ensuing day, when the body was inspected, the following appearances were found.

The vessels of the scalp emitted drops of viscid dark-coloured blood, which did not coagulate into clot and serum, but formed a thick semifluid homogeneous mass. The *pia mater* was numerously traversed by large vessels with innumerable minute branches, all containing very dark-coloured blood, but particularly so in the larger branches. The sinuses contained dark-coloured viscid, homogeneous blood, intermingled with some loose gory clots; and the dark inky-looking blood in the large vessels of the *pia mater* did not flow as usual, or separate into clot and serum. At the base of the brain the vessels of the *pia mater* were still more loaded with this black inky gore. The vertebral arteries, the basilar artery and its divisions, the carotid artery and its divisions, the Sylvian, and the anterior and posterior cerebral arteries, were all distended with the same dark-coloured gory blood. The substance of the brain presented upon division innumerable points and fissures, from which also dark-coloured semifluid blood issued; and the vicinity of the perforated spot, and the capsule of Reil, were tinged of a reddish-brown, where the vessels were most numerous and largest. The choroid plexus was thick, of a deep reddish-brown approaching to violet, and its vessels were much loaded with dark-coloured blood; and about four drachms of blood-coloured serum were found in the lateral ventricles, and a small quantity of the same bloody serum was found in the fourth ventricle.

Not only were the muscles of the back on both sides of the spinous processes deeply embrowned and blackened with an immense quantity of semifluid blood which did not separate into clot and serum, but even the osseous plates of the *vertebræ* were of a deep blue colour, in consequence of the quantity of dark blood which they contained. When the interior of the spine was laid open, the *theca* was found tinged of an inky-colour, and the cellular tissue connecting it to the inner surface of the spinal canal was also loaded with dark-coloured blood; while the rachidial veins contained much dark-coloured semifluid blood of the character similar to that found in the sinuses of the brain. The *pia mater* of the spinal chord presented dark-coloured vessels as numerously and of as deep a tint as those of the brain. A small quantity of bloody serum was found in the cavity of the canal, especially at the lumbar region. The substance of the chord was tinged of a reddish-brown, and was traversed by numerous vessels containing dark-coloured viscid gore; and the vessels near the *cauda equina* were also in the same state.

The cavity of each *pleura* contained about twelve ounces of wine-coloured serum. The surface of both lungs were of a deep inky-colour, in which the usual marbled appearance upon their surface was completely lost; and their substance condensed, uncrepitating, and indurated, especially towards the centre, and posterior parts. Upon dividing them the proper pulmonic tissue was found much consolidated and of a deep-black colour, yet discharged copiously from each incision much dark-coloured serum, while from each divided blood-vessel viscid, inky, semifluid gore dropped more slowly. The bronchial membrane was of a deep-brown colour, and the bronchial tubes were much loaded with dark blood-coloured mucus, viscid and consistent above, thinner and more fluid below. The pulmonary artery and its branches contained some loose clots of dark-coloured blood, and in the pulmonary veins were in like manner some portions of dark-coloured gory fluid.

Both ventricles of the heart were filled with dark-coloured clots and grumous blood; and the right ventricle was considerably enlarged, and its chamber distended.

In the stomach and intestines the most remarkable appearances were the following.

The mucous membrane of both was covered with much viscid adherent mucus, upon the removal of which the gastric mucous membrane was found of a dark-red colour in patches and points. The whole of the arteries of the stomach and intestinal tube were very much loaded with dark-coloured blood; and the branches especially of the *gastro-epiploica dextra* and *gastro-epiploica sinistra* were so much distended with dark-coloured blood as to give rise to large, livid, oblong patches corresponding to the course of the vessels. The same appearance in less degree was observed in the divisions of the mesenteric arteries in the small intestines. Upon laying open these vessels they were found to contain dark-coloured, semifluid, gory blood.

The kidneys presented both in their granular and tubular part, but especially the latter, much dark-coloured semifluid blood, indicating the extreme arterial congestion.

The close analogy or rather resemblance between the state of the various organs in this case, and in that of the persons destroyed by plague, as described by Chicoyneau, Verny, Soullier, Didier, Robert and Rimbaud in the Marseillese and Provençal epidemic of 1721 and 1722, cannot fail to be recognized by all those who have perused the writings published on that subject. The only circumstance wanting to complete the resemblance is the absence of carbuncles and buboes in the case of the patient now mentioned.

PATHOLOGY OF FEVER.—I come now to apply the facts furnished by inspection of the state of the organs after death, combined with observation of the functions during life, to elucidate the nature of the morbid process which takes place in Fever. Previous to this, however, it will be requisite for me to glance slightly, not at all the speculations which have prevailed on the Pathology of Fever, but at those which have been believed to be suggested chiefly if not exclusively by the state of the organs in the bodies of persons destroyed by this disease. I think I shall then be enabled not only to explain certain discrepancies which have at all periods of the study of pathology prevailed on this topic, but to show in what manner, from the just knowledge of the functions in their normal state, we may be enabled to comprehend the morbid deviations which they undergo during the presence of Fever.

It is remarkable that the majority of febrile distempers appear to direct the primary virulence of their action chiefly upon two classes of organs, the brain or nervous system generally, and the stomach and intestinal tube, or the alimentary canal generally; and hence the majority of attempts to explain the phenomena of these disorders have sought for them chiefly in lesions of the structure or functions of the nervous system, or of the gastro-enteric mucous membrane.

The first, and, perhaps, by reason of its plausibility, the most important doctrine on the Pathology of Fever is that which represents the phenomena of the disease to arise from, or depend upon disorder of the brain or its membranes, generally of inflammatory character. It had been imagined by many physicians that the brain or its membranes were disordered more or less seriously in fever. But the first person who appears to have advanced the doctrine in a definite shape was Chirac, who was appointed physician to the Regent of France in 1715, upon the death of M. Homberg, and, who in 1730, succeeded M. Dodart, as first physician to the King. In an epidemic of malignant fevers by which the town of Rochefort was afflicted for a whole year, and which presented many of the characters of pestilential fever, this physician inspected the bodies of many of those destroyed by the disease; and he recognised in the brain traces of intense inflammation and congestion, putrefaction, it is said, and preternatural softness of the substance of the organ, and even purulent deposits or abscesses. From these circumstances, M. Chirac inferred, that malignity or virulence in fevers depends on inflammation or congestion of the brain, of a purulent or gangrenous character.*

This doctrine, nevertheless, was very ably opposed by the author of the *Traité des Causes, des Accidens, et de la Cure de la Peste*, published at Paris in 1744, who justly remarked, that marks of inflammation of the brain are not observed in all cases of fever; that this organ very often presents its natural white colour and firm consistence; that preternatural softness and abscesses of the brain are rare; that the supposed traces of inflammation were apparent not real; that distension of the veins with blood was not to be regarded as proofs of inflammation; that the vascular congestions which took place towards the close of the disease were mistaken for its first causes; and that any appearances of this kind were not peculiar to the brain, but were common to the whole of the organs of the human body.†

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* Traite des Fievres Malignes et Pestilentielles, 12mo. Paris, 1742.

† Traité de la Peste, Part i. p. 70, Paris, 1744, 4to.

Pringle confined himself to the simple observation of the fact, that deposits of purulent matter or abscesses may be formed in the brains of persons labouring under malignant or jail fever,—without attempting to connect this circumstance very positively with the constant occurrence of inflammation of the cerebral matter.

In the same epidemic, in which Pringle observed collections of purulent matter in the brains of persons cut off by fever, Home found sinuous cavities containing matter in the brain, and some matter also in the *cerebellum;* and though he inferred from the symptoms, that the brain was the principal seat of the disease, he did not conceive himself authorized to conclude that every brain was affected in the same manner.*

A few years afterwards, however, in 1752, M. Marteau de Grandvilliers, physician to the hospital at Aumale, on occasion of an epidemic of the malignant character, with which that town was visited, was led to revive the doctrine of Chirac in a modified form, and to maintain, that the malignant fevers of Aumale were accompanied with a species of low or subacute inflammation of the brain.†

This doctrine, though not very generally received, appears, nevertheless, to have had the effect of directing the attention of physicians to the state of the brain during life, and after death, by continued fever. At all events, Borsieri and Eisfeld, who afterwards found purulent collections in the brains of persons destroyed by malignant fevers, were disposed to admit the occurrence of cerebral congestion and inflammation during fever, as an occasional combination, and as the principal cause of the fatal event.

Of an analogous character is the fact observed by Jemina in an epidemic fever prevalent at Montreal, in the territory of Turin, in 1783–84, that in several of the fatal cases, parts of the brain or *cerebellum* were found softened and pulpy, and in such a state of disorganization, as led this physician to infer that these parts of the brain were mortified. The knowledge of these facts seems to have led Reil to the conclusion, that cerebral inflammation, though not the cause of the symptoms of fever, may take place in the course of that disease.

The most decided attempt, however, to connect the phenomena of continued fever with those of inflammation of the brain was made during the same year, viz. 1800, by Ploucquet of Tuof abrasion. In 1818, several of the cases presented dark-red petechial spots of the intestinal mucous membrane; and in a woman named Finnie, these were large and distinct over the whole tract of the intestine. In the cases under treatment in 1832 and 1833, we were unfortunate in not obtaining permission to inspect any of the strongly-marked petechial cases, except that of John Boyle, in whose colic mucous membrane were found numerous minute oval ulcerations along its whole course, from the *caput cæcum* to the *rectum*. These ulcerations appeared to have taken place chiefly, if not entirely, in the mucous follicles of the bowel, in which these follicles are always insulated, and not aggregated in patches as in the ileum. But I do not regard this as either the effect or the cause of the febrile process, but as the consequence of previous disease, and only tending by their presence to give the fever a bad and complicated character, and to diminish the patient's chance of recovery. From the relatives of this man I had also ascertained that he was addicted to the habitual use of spirits, and that he had occasional attacks of *diarrhœa* for nine or ten months previous to that of the Fever which proved fatal.

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* Medical Facts and Experiments, London, 1759. *The observation was made in* 1742.

† Description des Fievres Malignes avec une Inflammation sourde du Cerveau, &c. Par M. Marteau de Granvilliers, Medicin de l'Hopital à Aumale.—Jour. de Medecine, Tome viii. 1758, p. 275.

Affection of the follicles of the intestinal mucous membrane was indeed rarely observed; and in one case only, that of Neil Black, did I find the aggregated follicles more distinctly developed than natural; and in one case only, namely, that of James Brand, æt. 24, were they in a state of actual inflammation and ulceration.

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Upon inspection on the 31st, the vessels of the *pia mater* were found minutely injected, but with little subarachnoid effusion. Upon dividing the substance of the brain, numerous points effusing fluid blood appeared. The ventricles were dilated, and contained about three drachms of serous fluid.

The lower portion of the *ileum* presented the agminated glands enlarged, and several of them in patches ulcerated, varying in size from the extent of a split-pea to that of a sixpence, in which the mucous membrane was destroyed, with a sharp elevated edge, while the submucous tissue was in some patches destroyed, and the *peritoneum* exposed, in others merely thickened. Nearer the lower extremity of the *ileum*, some of these patches presented in the centre a firm, leathery, inelastic sort of substance, like the coriaceous matter of the lichens, but tinged upon the surface with feculent matter. At the lower extremity of the *ileum* the patches were more numerous and extensive, and of a deep-red colour. The mucous membrane of the *ileum* was generally reddened, and in various parts elevated by enlarged and varicose vessels. Over the whole of the *ileum*, for about two feet from its lower extremity, the isolated glands were very distinct, and disseminated over the membrane like millet-seeds. In the colon, several of the isolated glands were indurated, elevated, and slightly ulcerated upon their summits.

The disease of the intestinal follicles here described cannot, I am satisfied, be regarded as either the cause of any part of the febrile symptoms, or the effect of the febrile process. The time which is requisite to produce this disease of the follicles is much longer than the ordinary duration of continued fever; and it is impossible to conceive all the changes observed in this case to have taken place within the space of eight or ten days. The coriaceous or fungous covering observed in some of the ulcers is manifestly part of the process of repair; and I had also ascertained from the relatives of this man that, previous to the attack of fever which had proved fatal, he had been liable to occasional attacks of diarrhœa, and other symptoms of disorder of the intestinal mucous membrane.

The kidneys were always more or less changed from the healthy structure. Their most usual appearance was that of a great quantity of dark-coloured semifluid blood in their arterial trunks and branches, with much black dying of their granular matter.

From the foregoing account it results, that in persons cut off by fever, we find not only certain changes peculiar to that disease, but various changes peculiar to various other affections. Thus we recognize distinct traces of *meningitis* in the head, sometimes softening and suppuration of the brain; in the chest traces of bronchitis or pneumonic inflammation of long standing, or both, and sometimes enlargement of the chambers of the heart; in the abdomen, traces of gastric or intestinal congestion, of gastric or intestinal follicular disease; occasionally enlarged or otherwise diseased liver, and not unfrequently diseased kidneys.

In addition to these appearances, however, in the internal organs, I have found various appearances in the skin, the muscles, the filamentous and other tissues, all of which, I conceive, belong more or less accurately to the process characteristic of fever. Thus the muscles were always deeply tinged with very dark-coloured blood, and their vessels were loaded and distended with dark-coloured semifluid blood, which issued from each incision. In the case of the man Macgrowther especially, the muscles of the neck, the chest, the belly, and the back, were almost perfectly blackened with dark-coloured blood, which was not less dark in vessels communicating with arteries than in those communicating with veins.

In order to ascertain something regarding the morbid anatomy of the stripes or livid patches (*vibices*) observed in the virulent forms of malignant fever, I made a slight incision into the skin of the nose of the man Boyle, in whom this part had become livid three days previous to the fatal termination. The incision showed the skin and subjacent cellular tissue to be deeply tinged by dark-coloured extravasated blood, while dark-coloured coagulated blood was contained in the minute vessels.

In another instance I had still more decided evidence of the state of the vessels in these patches in the living body.

A man of the name of M'Leod, aged 35, and who was a habitual drunkard, was admitted on the 1st February, after symptoms of fever of at least ten days' duration, in a state of the most complete dynamic oppression of all the tissues and organs. His extremities were cold and bluish-coloured, the pulse at the wrist imperceptible, and felt only at the bend of the arm to beat feebly at about 120 in the minute. The countenance was of a deep sallow dingy tint; the eyes suffused and muddy; the speech incoherent, and almost inarticulate; the muscular motions exceedingly feeble, and void of precision; the tongue covered with a thick, dry, blackish fur; the scalp hot; the breathing hurried and incomplete; and the belly was somewhat tender and distended.

Under the use of the warm-bath, shaving the head, and the compound calomel bolus, the countenance was clearer the following day, and the skin not worse. During the ensuing night, however, he had been extremely restless, and the delirium was considerably increased, with much stupor; and on the following day, a dark livid or violet-black patch was observed on the ulnar side, the posterior and anterior surface of the middle finger, and spreading partly up the skin of the hand, but of a colour less deep. This discoloured patch, I may add, was bounded by a circumscribed line, but with irregular or ragged edges, and the affected part of the hand was diffusely swelled. The latter circumstance led me to regard it as a form of a gangrene or gangrenous rose (*erysipelas gangrænosum*), and in this belief I made an incision through the skin of the livid patch of the finger down to the *periosteum*, which showed the skin and subjacent tissues to be of a deep crimson and violet-red colour, partly from injected and intra-vascular, but coagulated, partly from extravasated blood. From this deep incision only a few drops of dark-coloured viscid gore issued; a circumstance which indicated that the blood had in these vessels become fixed, stagnant, and decomposed, very nearly in the manner of a local gangrene.

It was extremely unfortunate that we were not permitted to inspect the internal organs of this man, since I entertained no doubt that they would have presented not only extensive previous lesions, and changes of structure, but a very intense degree of the peculiar state of the vessels, which I shall afterwards show takes place in fever. I am inclined, however, to regard the state of the organs exhibited by the man Macgrowther as adequate to supply this deficiency. In order that a connected view of these appearances may be given, I shall shortly state the leading circumstances.

This man, æt. about 38, a person of exceedingly dissolute habits, habitually addicted to the intemperate use of spirits, and reported to obtain his livelihood by the unlawful occupation of disinterment, was admitted on the 2d May, about the seventh or eighth day of fever, with symptoms indicating great dynamic oppression of all the órgans. His countenance and person were of a dirty leaden hue, his eye was suffused and muddy, the tongue was tremulous, and covered with a dark viscid fur; the muscular motions were almost entirely extinct; he had constant *subsultus tendinum* and *typhomania,* in which, however, stupor was more predominant than delirium; the pulse was about 88, very feeble, and small, and the respiration about 46, irregular, and incomplete. On the following day, with these symptoms, it was observed that there were occasional convulsive twitches of the face, puffing motion of the mouth and lips, with incapacity of swallowing, and constant *subsultus*, while little or no urine had been discharged, and the bowels had not been moved;—all symptoms indicating not only oppression of the brain and spinal chord by over-distension of its vessels, but great insensibility and *inertia* of all the organs. That night, with the typhomaniacal muttering, the insensibility was rather increased; the pulse was 84, extremely small, while the respiration was 52, chiefly performed by the diaphragm, and very laborious. An *enema* administered the previous evening had produced no stool, and no urine was discharged. Death took place in the course of the day.

On the ensuing day, when the body was inspected, the following appearances were found.

The vessels of the scalp emitted drops of viscid dark-coloured blood, which did not coagulate into clot and serum, but formed a thick semifluid homogeneous mass. The *pia mater* was numerously traversed by large vessels with innumerable minute branches, all containing very dark-coloured blood, but particularly so in the larger branches. The sinuses contained dark-coloured viscid, homogeneous blood, intermingled with some loose gory clots; and the dark inky-looking blood in the large vessels of the *pia mater* did not flow as usual, or separate into clot and serum. At the base of the brain the vessels of the *pia mater* were still more loaded with this black inky gore. The vertebral arteries, the basilar artery and its divisions, the carotid artery and its divisions, the Sylvian, and the anterior and posterior cerebral arteries, were all distended with the same dark-coloured gory blood. The substance of the brain presented upon division innumerable points and fissures, from which also dark-coloured semifluid blood issued; and the vicinity of the perforated spot, and the capsule of Reil, were tinged of a reddish-brown, where the vessels were most numerous and largest. The choroid plexus was thick, of a deep reddish-brown approaching to violet, and its vessels were much loaded with dark-coloured blood; and about four drachms of blood-coloured serum were found in the lateral ventricles, and a small quantity of the same bloody serum was found in the fourth ventricle.

Not only were the muscles of the back on both sides of the spinous processes deeply embrowned and blackened with an immense quantity of semifluid blood which did not separate into clot and serum, but even the osseous plates of the *vertebræ* were of a deep blue colour, in consequence of the quantity of dark blood which they contained. When the interior of the spine was laid open, the *theca* was found tinged of an inky-colour, and the cellular tissue connecting it to the inner surface of the spinal canal was also loaded with dark-coloured blood; while the rachidial veins contained much dark-coloured semifluid blood of the character similar to that found in the sinuses of the brain. The *pia mater* of the spinal chord presented dark-coloured vessels as numerously and of as deep a tint as those of the brain. A small quantity of bloody serum was found in the cavity of the canal, especially at the lumbar region. The substance of the chord was tinged of a reddish-brown, and was traversed by numerous vessels containing dark-coloured viscid gore; and the vessels near the *cauda equina* were also in the same state.

The cavity of each *pleura* contained about twelve ounces of wine-coloured serum. The surface of both lungs were of a deep inky-colour, in which the usual marbled appearance upon their surface was completely lost; and their substance condensed, uncrepitating, and indurated, especially towards the centre, and posterior parts. Upon dividing them the proper pulmonic tissue was found much consolidated and of a deep-black colour, yet discharged copiously from each incision much dark-coloured serum, while from each divided blood-vessel viscid, inky, semifluid gore dropped more slowly. The bronchial membrane was of a deep-brown colour, and the bronchial tubes were much loaded with dark blood-coloured mucus, viscid and consistent above, thinner and more fluid below. The pulmonary artery and its branches contained some loose clots of dark-coloured blood, and in the pulmonary veins were in like manner some portions of dark-coloured gory fluid.

Both ventricles of the heart were filled with dark-coloured clots and grumous blood; and the right ventricle was considerably enlarged, and its chamber distended.

In the stomach and intestines the most remarkable appearances were the following.

The mucous membrane of both was covered with much viscid adherent mucus, upon the removal of which the gastric mucous membrane was found of a dark-red colour in patches and points. The whole of the arteries of the stomach and intestinal tube were very much loaded with dark-coloured blood; and the branches especially of the *gastro-epiploica dextra* and *gastro-epiploica sinistra* were so much distended with dark-coloured blood as to give rise to large, livid, oblong patches corresponding to the course of the vessels. The same appearance in less degree was observed in the divisions of the mesenteric arteries in the small intestines. Upon laying open these vessels they were found to contain dark-coloured, semifluid, gory blood.

The kidneys presented both in their granular and tubular part, but especially the latter, much dark-coloured semifluid blood, indicating the extreme arterial congestion.

The close analogy or rather resemblance between the state of the various organs in this case, and in that of the persons destroyed by plague, as described by Chicoyneau, Verny, Soullier, Didier, Robert and Rimbaud in the Marseillese and Provençal epidemic of 1721 and 1722, cannot fail to be recognised by all those who have perused the writings published on that subject. The only circumstance wanting to complete the resemblance is the absence of carbuncles and buboes in the case of the patient now mentioned.

PATHOLOGY OF FEVER.—I come now to apply the facts furnished by inspection of the state of the organs after death, combined with observation of the functions during life, to elucidate the nature of the morbid process which takes place in Fever. Previous to this, however, it will be requisite for me to glance slightly, not at all the speculations which have prevailed on the Pathology of Fever, but at those which have been believed to be suggested chiefly if not exclusively by the state of the organs in the bodies of persons destroyed by this disease. I think I shall then be enabled not only to explain certain discrepancies which have at all periods of the study of pathology prevailed on this topic, but to show in what manner, from the just knowledge of the functions in their normal state, we may be enabled to comprehend the morbid deviations which they undergo during the presence of Fever.

It is remarkable that the majority of febrile distempers appear to direct the primary virulence of their action chiefly upon two classes of organs, the brain or nervous system generally, and the stomach and intestinal tube, or the alimentary canal generally; and hence the majority of attempts to explain the phenomena of these disorders have sought for them chiefly in lesions of the structure or functions of the nervous system, or of the gastro-enteric mucous membrane.

The first, and, perhaps, by reason of its plausibility, the most important doctrine on the Pathology of Fever is that which represents the phenomena of the disease to arise from, or depend upon disorder of the brain or its membranes, generally of inflammatory character. It had been imagined by many physicians that the brain or its membranes were disordered more or less seriously in fever. But the first person who appears to have advanced the doctrine in a definite shape was Chirac, who was appointed physician to the Regent of France in 1715, upon the death of M. Homberg, and, who in 1730, succeeded M. Dodart, as first physician to the King. In an epidemic of malignant fevers by which the town of Rochefort was afflicted for a whole year, and which presented many of the characters of pestilential fever, this physician inspected the bodies of many of those destroyed by the disease; and he recognized in the brain traces of intense inflammation and congestion, putrefaction, it is said, and preternatural softness of the substance of the organ, and even purulent deposits or abscesses. From these circumstances, M. Chirac inferred, that malignity or virulence in fevers depends on inflammation or congestion of the brain, of a purulent or gangrenous character.*

This doctrine, nevertheless, was very ably opposed by the author of the *Traité des Causes, des Accidens, et de la Cure de la Peste*, published at Paris in 1744, who justly remarked, that marks of inflammation of the brain are not observed in all cases of fever; that this organ very often presents its natural white colour and firm consistence; that preternatural softness and abscesses of the brain are rare; that the supposed traces of inflammation were apparent not real; that distension of the veins with blood was not to be regarded as proofs of inflammation; that the vascular congestions which took place towards the close of the disease were mistaken for its first causes; and that any appearances of this kind were not peculiar to the brain, but were common to the whole of the organs of the human body.†

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* Traité des Fievres Malignes et Pestilentielles, 12mo. Paris, 1742.

† Traité de la Peste, Part i. p. 70, Paris, 1744, 4to.

Pringle confined himself to the simple observation of the fact, that deposits of purulent matter or abscesses may be formed in the brains of persons labouring under malignant or jail fever,—without attempting to connect this circumstance very positively with the constant occurrence of inflammation of the cerebral matter.

In the same epidemic, in which Pringle observed collections of purulent matter in the brains of persons cut off by fever, Home found sinuous cavities containing matter in the brain, and some matter also in the *cerebellum;* and though he inferred from the symptoms, that the brain was the principal seat of the disease, he did not conceive himself authorized to conclude that every brain was affected in the same manner.*

A few years afterwards, however, in 1752, M. Marteau de Grandvilliers, physician to the hospital at Aumale, on occasion of an epidemic of the malignant character, with which that town was visited, was led to revive the doctrine of Chirac in a modified form, and to maintain, that the malignant fevers of Aumale were accompanied with a species of low or subacute inflammation of the brain.†

This doctrine, though not very generally received, appears, nevertheless, to have had the effect of directing the attention of physicians to the state of the brain during life, and after death, by continued fever. At all events, Borsieri and Eisfeld, who afterwards found purulent collections in the brains of persons destroyed by malignant fevers, were disposed to admit the occurrence of cerebral congestion and inflammation during fever, as an occasional combination, and as the principal cause of the fatal event.

Of an analogous character is the fact observed by Jemina in an epidemic fever prevalent at Montreal, in the territory of Turin, in 1783–84, that in several of the fatal cases, parts of the brain or *cerebellum* were found softened and pulpy, and in such a state of disorganization, as led this physician to infer that these parts of the brain were mortified. The knowledge of these facts seems to have led Reil to the conclusion, that cerebral inflammation, though not the cause of the symptoms of fever, may take place in the course of that disease.

The most decided attempt, however, to connect the phenomena of continued fever with those of inflammation of the brain was made during the same year, viz. 1800, by Ploucquet of Tubingen, and by Costantin of Leipsic. The leading principle of the former author consists of two propositions;—the first that all the symptoms of *Typhus* indicate the disease to be seated in the brain; and the second, that these symptoms, with the appearances after death, show that this morbid state of the brain consists in inflammation. The latter author applies at once the name of *Encephalitis* or cerebral inflammation, to designate a form of fever which he represents to belong to the cerebral and cerebellic vessels and membranes; and this he distinguishes, in imitation of Reil and the German authors, into three genera, viz. *Synocha*, *Typhus*, and *Paralysis*; the first distinguished by increased irritability, with normal or increased reaction; the second by increased irritability, but impaired reaction; and the third, by irritability and reaction, being equally impaired, inert, and more or less completely extinguished.

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* Medical Facts and Experiments, London, 1759. *The observation was made in* 1742.

† Description des Fievres Malignes avec une Inflammation sourde du Cerveau, &c. Par M. Marteau de Granvilliers, Medicin de l'Hopital à Aumale.—Jour. de Medecine, Tome viii. 1758, p. 275.

Without apparently being aware of these facts, and of the conclusions which they were conceived adequate to substantiate, Dr Clutterbuck of London, in 1807, published an Inquiry into the seat and nature of fever, in which he undertook to demonstrate, not so much from the morbid anatomy of persons destroyed by fever, as from reasoning from the symptoms and the disorder of the functions generally,—the two propositions, 1*st*, that proper or idiopathic fever is not primarily a disease of the whole system, as has been commonly supposed, but a topical affection of the brain; and 2*dly*, that this affection consists in inflammation of the cerebral substance, evinced by appropriate signs, and that any general disorder which takes place in the system at large is altogether symptomatic of the local affection, as in disorder of any other organ.*

This doctrine, though opposed by Beddoes and many others in this country, found two strenuous defenders in Dr Mills of Dublin, and Professor Marcus of Bamberg in Bavaria. I have elsewhere shown that it is untenable, for several reasons which I need not here repeat.† One of the most obvious objections is this, as I have already stated, that it is not in the brain only that we recognize symptoms of morbid action, but in the heart and lungs, in the stomach, *duodenum*, and intestinal tube; in the liver and spleen, and in the kidneys; and that the symptoms which succeed unequivocal inflammation of the brain ensuing upon injuries of the head are by no means the same either in character or duration as those which attend continued fever.

An objection not less insurmountable, however, to the validity of this doctrine is found in the evidence which morbid anatomy has been conceived to afford in favour of another;—that, namely, which represents fever to depend upon disorder more or less definite, and more or less intense, of the tissues composing the alimentary canal.

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* An Inquiry into the Seat and Nature of Fever. Lond. 1807 and 1825.

† Elements of General and Pathological Anatomy, p. 177.

It was early observed by Thomas Bartholin, that in the bodies of persons cut of by fever there were traces of inflammation of the stomach or intestines; that occasionally pustules were found in the stomach, and sometimes marks of gangrene in the alimentary canal. It was afterwards observed by Stoll, that in malignant or typhous fever the *ileum* was occasionally inflamed and traversed by vessels loaded with dark-coloured blood.[*] In 1772 Arnold Wienholt, a pupil of Gottingen, adduced from the writings of various authors facts to show, that in putrid or malignant fevers there were often latent or obscure marks of inflammation of the stomach, *duodenum*, intestines, or the liver, especially its concave part.[†] A still more definite view of this doctrine was given by Gottlieb Albrecht Gottel, who, in 1781, maintained, that the slow nervous fever of Huxham and the English, which he referred to the head of putrid fevers, ought like them to be united to the class of gastric and intestinal or gastro-enteric fevers, and that their existence depended on some lesion of the stomach and bowels, which gave rise to the presence of putrid matter in their cavities. In establishing this doctrine he dwelt particularly on the symptoms of loathing, squeamishness, and vomiting, upon the foul fur of the tongue, the relief by spontaneous vomiting, the frequent occurrence of diarrhœa, and the redness of the face, which, upon the authority of Stoll, he rather unaccountably set down as a symptom indicating the presence of morbid secretion in the stomach and *duodenum*.[‡]

This doctrine received some confirmation from the observations of Reil, who found in the intestines of persons cut off by fever much viscid mucus, (*pituita*,) and occasionally ulceration of the *œsophagus*, stomach, and intestines;[§] and Hopfengartner, who found the abdominal *viscera*, and the intestines, in particular, he states, corrupted, that is, I presume, thickened, discoloured, and softened, probably vascular.

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[*] Stoll, Rat. Medend. Part vii. p. 188.

[†] Arnoldi Wienholdt, Dissert. de Inflam. Visc. Occult. apud Frank. Delect. Vol. i. p. 130.

[‡] Gott. Alb. Dissert. De Febris Lentæ Nervosæ Natura, Halae, 1781, apud Frank. Delect. Vol. v.

[§] "In cadaveribus incisis tunicas ventriculi, mesenterii, omenti, intestinorum, et ex iis præcipue tunicas jejuni ruberrimas, earumque vasa minora ita sanguine turgida inveni, ut panno scarlatino similes essent. In aliis sectionibus pulmonum superficiem, ad plurium linearum altitudinem corruptam et maculis nigris sphacelatis, ad imperialis magnitudinem accedentibus, notatam comperi. Vidi amplas continui solutiones in tunicis ventriculi et intestinorum; immo uno in cadavere œsophagum ad palma latitudinem omnino consumtum. Quibusdam harum continui solutionum cruentæ nigræque oræ erant, vasaque in ambitu sanguine turgida; aliæ vero marginibus ita albidis cernebantur, ut amissam partem, quasi ex sano viscere, cultro excisam crederes. Hæ lesiones, post mortem deprehensæ, in vivo ægro, nulla sui præsentiæ signa dabant, ideoque dubita, an, vita superstite, jam adfuerint. Item longe alienus sum ut eas, tamquam effectus ventilatarum inflamma-

Notwithstanding all this testimony, however, no person appears to have had courage to take this theory under his special protection before Broussais, who was led from a variety of circumstances, but chiefly the distension and tenderness of the epigastric region, to infer that the mucous membrane of the stomach and bowels was invariably the primary seat of disorder in fever; that there was no such disease as primary or idiopathic fever; and that the disease always depended upon inflammation of the stomach, intestinal tube, or both.

This doctrine contained some truth, mixed with a good deal of error. The doctrine was true in so far as it represented the stomach and intestinal tube to be disordered in fever. But it was erroneous in representing that there is no such disease as idiopathic fever; that fever was always symptomatic of inflammation of a particular organ; and that the symptoms of malignant fever always depend upon inflammation of the stomach and intestinal tube.

Andral, Billard, and Louis have been laudably employed in investigating the morbid anatomy of the alimentary canal in persons destroyed by fever upon the continent; and Drs Bright and Tweedie have undertaken the same task with regard to fever in this country; and the general result of their investigations may be stated to be, that inflammation of the gastric or intestinal mucous membrane, or inflammation, enlargement, or ulceration of its mucous follicles may coexist with fever, and determine the fatal termination, or, at least, interfere with the sanative powers of the constitution, and prevent recovery. The very circumstance, even, of these lesions being found in most of the fatal cases, ought to lead to the inference, that they are connected with the fatal termination, though not necessarily connected with the febrile process. I think, even, that there is good evidence to show that some degree of these lesions, not inconsiderable, must have preceded the attack of fever; that their presence in the individuals attacked proved one of the principal predisposing causes; and that, under all circumstances, the existence of such lesions concurred, with the febrile disorder, to aggravate the symptoms and diminish the chance of recovery.

After these preliminary observations, I apply the facts disclosed by morbid anatomy to explain the phenomena and effects of fever in the following manner.

It may be regarded as a point established by numerous ob-

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tionum, venditem, earum scilicet, quibus clandestinarum cognomen, ab occulta sui indole, appositum habemus."—J. C. H. Reil, Memorab. Clin. Vol. i. Fasc. i. p. 12.

servations and experiments, that, in the healthy state of the animal frame, the blood is moved steadily and uniformly at a given rate from the arteries into the capillary vessels of the different tissues, for the purpose of nutrition, secretion, and the various functions required by the different organs; that in these capillary vessels it also moves steadily and uniformly, while it contributes to the processes now mentioned; and that it is with equal regularity and uniformity, and at the same rate of rapidity, received by the minute veins, and moving from them into the trunks, is thence conveyed to the left auricle and ventricle, to be eventually circulated by the pulmonary artery through the lungs, and there subjected to the influence of the atmospheric air.

It may also be regarded as established, that in this course it moves with the greatest degree of rapidity in the state of health, when the heart is contracting slowly, but regularly, uniformly, and completely, at the rate of 68 or 70 times in the minute, and when breathing is performed by means of inspirations, which are deep, full, and complete, or in which the chest is slowly, steadily, and fully enlarged, at the rate of 17 or 18 times in the minute. Conversely, it may be regarded as established, that when the heart contracts more frequently than 70 or 72 times in the minute, and when breathing is performed by a greater number of inspirations than 18 or 20 in the minute, as it will be found, that the cardiac contractions are preternaturally hasty, and succeed each other too rapidly, and the inspirations are limited, incomplete, and inadequate, and require expiration preternaturally soon, so it results that the blood not only moves more slowly from the arterial to the venous division of the vascular system, but encounters an actual impediment to its transition through the capillary vessels.

When the process of fever commences, the first step is impaired transition of blood in the capillaries, not of any particular organ or tissue, but of the whole frame at large,—not of the brain, spinal chord, or nervous system,—not of the stomach or intestinal tube only, but of the skin, of the mucous and serous membranes, of the secreting glands, of the muscles, and even of the bones and the periosteum. I do not regard it as of any moment to inquire what is the cause of this impaired power of transmission. That may depend either on loss of power, or atony or *inertia* in the capillary vessels, or some lesion or temporary suspension of their innate energy, or in some change in the qualities of the circulating fluid. All that I think can be established with certainty is, loss of this transmitting power by some means or other.

That this impaired transmission does take place is to be inferred from the following facts. All the superficial arteries, as the temporal, become much distended, and are elevated into strong relief during the first days of fever; and this distension only abates and disappears after the employment of suitable evacuation, or in consequence of the natural change which takes place after some days under the use of remedies, abstinence, and diluents. The injection of the eyes, which takes place in the early stage of fever, is a fact of the same character. In the dead body, after fatal cases of fever, we find the arteries of all the organs very much distended with dark-coloured blood; an evident proof that that fluid had not passed from the arteries through the capillary system into the veins.

Secondly, this interruption of the transmission of the blood in the capillaries cannot exist long without causing congestion of all the arterial tubes leading to the capillaries; and, in point of fact, we find the arteries of all the organs, as already repeatedly stated, more or less filled, sometimes distended, with dark-coloured blood. The effect, therefore, of this impaired transmissile power of the capillary vessels is to induce accumulation of blood in the arteries backwards towards the heart, or, in other words, to cause arterial congestion of all the organs.

Let us now advert to the influence of this impaired transmission in the veins. As the blood sent to, or found in the capillaries at the moment of the onset of fever is not propelled onwards, but stagnates and accumulates in the arterial division of that system of vessels, it is clear that it is at first imperfectly and partially transmitted to the veins, and that eventually, unless through the intervention of remedies, spontaneous or artificial, it ceases altogether to be sent to these vessels, which thus being less regularly filled than in the healthy state, or partially emptied, become flaccid and inert, cease to give the organs the usual support, which in their natural tension they were adequate to afford, and convey blood to the right ventricle and pulmonary artery in much smaller quantity than they were wont.

Here, therefore, we observe a very peculiar derangement in the capillary circulation of every organ of the human body. We have preternatural fulness, accumulation, and distension in the arterial division of the capillary system, and undue emptiness, flaccidity, and diminished tension in the venous division of that system, consequently pressure or even oppression of all the organs at the parts at which arteries enter, and undue want of support at those points at which the veins quit these organs. Each tissue and each organ, in short, is subjected during the process of fever to a combined and mingled pressure or oppression by arteries, undue, because unnatural,—and a want of the wonted support which it derived from the fulness of the minute veins, enfeebling and exhausting, because withdrawing quickly a species of habitual support, without substituting any other in its place.

In the *third* place, however, I have to remark, that, at the same time at which the capillary vessels of the system at large are smitten with this atony or loss of transmissile power, a similar and equal degree of atony or loss of energy affects those capillary vessels interposed between the pulmonary artery and veins, which contribute to the small or pulmonary circulation. Through these vessels the blood is transmitted less freely and perfectly than in the state of health; it consequently is accumulated in the arterial division of these capillaries, and in the branches and trunk of the pulmonary artery, and in the right ventricle and auricle, which thus become unduly distended during the first or initial days of fever; while, as it moves less freely into the pulmonary veins, these vessels are less abundantly supplied than the exigencies of the system require; and the left auricle and ventricle are therefore less abundantly supplied with red, arterial, or respired blood than in the state of health.

The result of this lesion is not only undue accumulation in the right chambers of the heart and the arterial division of the pulmonary capillaries, but consequent imperfect respiration or aeration of the blood, which is thus impeded in its transition through the pulmonary capillaries.

It is to be remembered at the same time, that though the left auricle and ventricle receive less than the due proportion of blood from the lungs, much blood, which is prevented from circulating through the capillary vessels of the system at large, is necessarily accumulated in the arterial branches and trunks, and backwards even to the left ventricle. This blood is always dark-coloured in the capillaries after it has remained long there, and in the small arteries terminating in these capillaries; and it is only in the large branches and trunks, and during the early days of fever, that it retains the bright red tint peculiar to arterial blood. After the continuance of the disease for a few days, while the general capillary circulation is becoming every hour more impeded and slower in motion, and while in consequence of similar impediment and retardation of the pulmonary capillaries, and consequent imperfect aeration of the blood conveyed by the veins to the right ventricle and pulmonary artery, the blood in the left auricle and ventricle receives hourly a smaller proportion of bright-red, well-aerated blood, the residual quantity which is prevented from passing into the small arteries and the arterial capillaries, gradually becomes darker, until, if the disease be continued, it acquires a tint not much less deep than that of the right auricle and ventricle.

Fever, according to this view, consists in a twofold lesion;

one of the capillaries of the general circulation, and one of those of the pulmonary circulation, so arranged and so acting on each other, that, separately and conjointly, they give rise to an assemblage of symptoms which evince not only dynamic oppression of all the organs for the time, with interruption of the motion of the blood, and consequent suspension of their functions, but suspension of the process of efficient aeration of the blood, or, in other words, defective respiration and arterialisation, the veins not being adequately supplied with blood from the capillaries, and those of the lungs being inadequate to effect the requisite changes.

It hence results, that the blood undergoes in Fever two changes. That in the arteries and arterial division of the capillaries, by being gradually retarded in its motion, until in many of them it ceases entirely to move, begins to be decomposed, and to lose the property of spontaneous separation into clot and serum, while, from the same cause, it gradually loses its characteristic arterial colour, and blackens all the organs. That in the veins, by ceasing to be uniformly moved through the pulmonary capillaries and respired, ceases to acquire that renovation of qualities which in the healthy state it receives in the lungs. Many circumstances show that among these changes the power of spontaneous separation or coagulability is one of the most prominent; and as this in the healthy state is always kept by the lungs at a certain standard, the moment the febrile disorder begins to operate, this property begins to be impaired in energy, and, after passing through various successive stages, to be lost entirely. This, I conceive, is the true cause of the semifluid state of the blood, and its loss of coagulable power in the concluding stages of malignant or fatal fever.

I shall only pause here to show shortly how much more accurately this view explains the peculiar symptoms of fever, than either the doctrines of impaired nervous energy, or increased local determination of blood, or, in short, any of the other unphysiological speculations which have been advanced on this subject.

To explain the delirium of fever, Cullen had recourse to the fanciful but gratuitous hypothesis of excitement and collapse, and the supposition of an irregular distribution of blood in the brain. Of the former he speaks in very mysterious and not very intelligible terms. The latter he nowhere defines with any distinctness whatever. The phenomena which Cullen attributed to excitement, I regard as arising from undue arterial distension, with stagnant and consequent long-continued unrespired blood. The phenomena which he refers to collapse, I conceive depend simply on emptiness and want of tension of the veins. The unequal distribution of this author I regard as the combined state of arterial capillary distension and venous capillary emptiness.

That the idea of increased local determination in fever is an assumption entirely gratuitous and unfounded, I have already attempted to prove in the Elements of Pathological Anatomy; and I believe it is superfluous here to resume the subject. I conceive it clearly results, from every thing we observe, that mere resistance or impaired transmission in the capillaries will produce all the phenomena attributed to increased determination.

Without, however, fettering myself with the task of reconciling the discordance between the doctrines of others and the phenomena, I think it will be easy to show that the present view explains all the phenomena of fever clearly and satisfactorily.

The weight, pain, and distension of the head,—the throbbing and sense of beating within it, are evidently the result of the arterial injection and congestion, since every artery contains more blood than it ought, and in a fixed column, and every contraction of the heart is transmitted by this column much more intensely than in the healthy state of the circulation to the brain. The arterial accumulation, however, could never explain the feebleness, the sense of weakness and fainting in the erect position, and the incapacity, in short, to maintain the erect position. These phenomena are occasioned by the emptiness of the venous capillaries, and the consequent deficient support given by that order of vessels. The two states taken together give rise to the confusion of recollection and thought, the *delirium* and even the *typhomania.*

The state of the circulation of the alimentary canal gives rise to most of the phenomena of disordered digestion. As in the sound state the blood moves readily and freely from the arteries into the capillaries, and contributes there to the various secretions carried on by the gastro-intestinal surface, and is thence uniformly and regularly conveyed by the veins to the *vena portæ* and liver,—so the moment that the gastro-enteric capillaries begin to be affected by fever, the blood begins to move more slowly than natural, and, consequently, is accumulated backwards in the arterial branches and trunks. Gastric and intestinal fluid then either cease to be secreted in proper quantity and quality, or are secreted in a morbid form. The mucous membrane, which in the healthy state secretes only mucus to be interposed between the membrane and the alimentary matters,—under its new irritation becomes first dry and thick, and then begins to secrete copiously a viscid mucus, and eventually under this action becomes partially softened. As this process advances, digestion is either entirely impaired or much interrupted. The mucus and articles of food and drink swallowed not being digested for want of proper gastric fluid, are decomposed, and give rise to the formation of gaseous products, which consequently distend unnaturally the bowels, in which they are evolved. This is the *colluvies* and *sordes* or impurities of the *primae viae* mentioned by the old pathologists.

In the same state also we perceive the cause of the distension and tenderness of the epigastric and umbilical regions, the sense of weight and anxiety in these regions, the wandering pains of the abdomen generally, the torpor and insensibility of the intestinal canal to purgatives, and the occasional tympanitic state of the belly, which takes place towards the close of malignant cases. The first depends upon the irritation occasioned by the vascular distension of the mucous and submucous tissues, with the mechanical distension induced by the evolution of gaseous products; the second, partly upon the same circumstances, with the gradually increasing congestion of the arteries; the third proceeds from the derangement of circulation and secretion generally; and the fourth circumstance depends partly upon the vascular congestion and interruption of circulation in the gastro-intestinal tissues, and partly upon the load of viscid mucus by which it is lined, and which prevents the remedial agents from coming in immediate contact with the proper mucous surface.

With regard to the different secretions, it is not difficult to perceive that the accumulation of blood in the glandular capillaries, and the temporary atony of these vessels, must interfere very materially with the process of secretion.

In the case of the liver, the distribution of its vessels gives rise to a complex form of disorder in that gland. Thus not only do its capillaries partake of the general atony or loss of energy, and, consequently, cease to transmit their blood with due facility and freedom; but, as the whole of the intestinal capillaries are at the same time affected with similar derangement of action, the blood does not move into the minute veins with normal facility; the *vena portae* is hence not duly or copiously supplied with blood; and, consequently, that fluid is conveyed more slowly, and in less quantity, than natural to the hepatic capillary vessels. Here, therefore, are produced a degree of accumulation in the capillaries communicating with the hepatic arteries, and a degree of undue depletion or emptiness in those connected with the portal vein, which must exercise no inconsiderable influence on the secretion of the bile; while the branches of the hepatic veins must be also depleted, in consequence of the blood flowing in less quantity from the latter vessels, and passing with difficulty from the former. A check is thus given to the due and normal secretion of bile, while the liver itself is thrown into a state partly of *asphyxia*, partly of *syncope*.

The state of the circulation and secretion of the kidneys and other glands is more simple. By the capillaries losing a great part or the whole of their transmissile power, the blood is at once retarded and accumulated in these vessels and the arteries supplying them, and prevented from reaching and distending the veins; while, in consequence of this impediment to the circulation, the urine is secreted in smaller quantity, and in very disordered quality, during the continuance of fever, and in fatal cases it often ceases to be secreted altogether. These phenomena have been repeatedly ascribed to torpor or inaction of the kidneys; but the torpor or *inertia* is the immediate effect of the great dynamic oppression by which their vessels are overpowered.

The pains felt in different parts of the body, the sense of bruising, fatigue, and even loss of muscular power, are to be ascribed to the imperfect circulation which takes place in the capillary vessels of the muscles and their investments. The great loss of muscular energy has been often ascribed to the oppression of the nervous system, especially that of the brain and spinal chord, and its membranous investments; and in this representation unquestionably there is much accuracy. But, independent of the oppression of the capillaries of the nervous system, such cases as that of Macgrowther show, how much the circulation of the muscular capillaries has been deranged in the course of fever,—how unfit their fibres must thus be rendered for the proper performance of their functions,—how much their common and proper sensibility (*coenaesthesis* and *idiaesthesis*,) must be impaired and perverted, and, consequently, how incapable they are of either receiving impressions or obeying those transmitted. From this circumstance, I conceive we must infer, that, though the state of the capillaries of the nervous system has great influence in impairing the motions of the muscular, the state of the muscular capillary vessels themselves is in an equal degree concerned in the production of the symptoms now mentioned. The capillaries of the muscles, indeed, tend gradually to a state of *haemastasis* or *asphyxia* in fever; and in fatal cases they generally present the usual appearances of asphyxial or hemastatic *adynamia*.

The whole of the disorder of the capillaries of the general circulation, however, is very much aggravated by the same state taking place in the lungs. The impaired aeration or renovation of the venous blood then proceeds *pari passu*, or at an equal rate, with the disorder of the general circulation; and, consequently, as the venous blood is every hour less perfectly aerated or respired while the febrile process continues, and a small proportion of renovated blood is transmitted to the left auricle, and with increased difficulty, eventually all the blood of the vessels becomes the same unchanged dark-coloured semifluid gore, and all the organs and tissues become almost or altogether poisoned by the load of dark-coloured blood with which their capillaries are oppressed.

This state of the lungs in the early stage of fever before the capillaries of the several organs are much oppressed, by distending the pulmonary artery and right ventricle, concurs, with the analogous state of the aorta and left ventricle, in causing the peculiar sense of stifling weight beneath the *sternum*, oppression and anxiety deep in the chest, and with the state of the stomach in causing the epigastric load so invariably observed in fevers. It then prevents the patient from inspiring deeply, and, consequently, increases the number, and diminishes the extent of the inspirations in a given time. Not unfrequently it causes repeated sighing and an unsteady vibratory expansion of the chest, and occasionally it seems to oppress the respiration so completely as to give the appearance of great and irresistible feebleness of the muscles of respiration. I am satisfied, from frequent observation of patients in this state, and from watching the effects of various remedies, that the debility so induced is caused by the pulmonary capillaries being unable to transmit their contents to the pulmonary veins and right auricle, and thereby inducing congestion of the pulmonary artery and right ventricle, and consequent incapacity to inspire a sufficient quantity of air to induce the requisite changes in the venous blood.

At a later period of the disease, when this function is still more completely interrupted, it induces more conspicuous changes, and, indeed, modifies all the symptoms of Fever.

This is the state of the circulation which gives the grim lurid aspect, and sallow, dingy tint to the complexion in the concluding stages of *Synochus* and *Typhus*, and which causes the eruptions of *Stigmata* and petechial spots, the appearance of violet stripes (*molopes*, *vibices*,) and marbled patches in various parts, which are either much compressed, or are remote from the heart. This state seems also more readily and rapidly to induce that oppression of all the organs than mere arterial congestion would do,—the stupor and insensibility in the head, the inert and torpid state of the alimentary canal, the suspended and enfeebled action of all the glands, and, in short, the general torpid state of the system at large.

When, in cases of this description, the fatal event takes place, it never fails to be preceded by rapid, short, feeble, and inefficient respiration, tracheo-bronchial rattling, and all the usual signs of *peripneumonia notha*, lasting for five or six hours; and in the dead body the vessels of the lungs are found loaded with dark-coloured, semifluid, viscid blood, the bronchial tube and vesicles with much frothy blood-coloured serum, and the pulmonic tissue dense, inelastic, and heavy, with bloody serum, and occasionally extravasated blood; and at its margins not unfrequently emphysematous patches. These symptoms and appearances denote the presence of a slowly approaching lesion of the function of respiration, which proceeds through various successive steps, unless it terminates in complete *asphyxia.*

This is the state of the system, also, which gives rise to the assemblage of symptoms denominated by Reil, Costantin, and the pathologists of the German school *Paralysis* (Lahmung,) of the different organs, in consequence of the inert or torpid state to which they are brought by the febrile process. My limits do not allow me in this sketch to consider the merits of this denomination so applied. But I must observe, that the palsy of the organs here referred to does not consist, as might be imagined, in a loss of motion, so much as in dynamic oppression of their blood-vessels, consequent enfeeblement, if not extinction, of all their properties, and hence more or less inability to perform their appropriate functions. Physiologically examined, it partakes more of *asphyxia* than of any other state; since it consists in more or less interruption of the motion of the blood in the capillaries, and a slow and gradual conversion of all their blood not into venous, but into a species of viscid semifluid gore, (*cruor,*) void of coagulability, or the property of spontaneous separation into clot and serum. The principal difference between this form of *asphyxia* and that which commences by the lungs exclusively, is, that the former is slow and gradual, whereas the latter is sudden and speedy.

After the foregoing explanation of the mode in which the blood loses, during fever, its characteristic properties of spontaneous separation into clot and serum, and fluidity, and is converted into a viscid, semifluid, dark-doloured homogeneous substance, I think it superfluous to advert particularly to those hypotheses in which the blood is represented to be deprived of the whole or part of its saline impregnation, as maintained by Dr Stevens, or to have the proportion of its animal and saline principles diminished, as taught by Dr Reid Clanny. Without pretending to deny entirely the facts as thus represented, I conceive they are the effect of the disorder and atony of the general and pulmonary capillary systems during fever, and, though the cause of some of the symptoms of the disease, are not the cause of the disease itself.

According to the views now submitted, which, I may observe, flow necessarily and directly from the just physiological principles of the arterial and venous circulation, combined with the anatomical facts furnished by the inspection of the bodies of persons destroyed by fever,—the state of the capillary vessels and of the circulation, generally, in Fever embraces the following assemblage and train of circumstances.

In the *first* place, impaired energy simultaneously of the capillary vessels of the general circulation and the pulmonary circulation, and inability to transmit blood in natural quantity and velocity for the purposes either of nutrition, secretion, or excretion, or for that of respiration or aeration respectively; *secondly*, distension of the capillaries and the arteries proceeding to them, viz. of the branches of the aorta, and also of the pulmonary artery; *thirdly*, irritative stimulus, physical and physiological, either at the same time, or within a short interval, to both ventricles of the heart, the left by the unpropelled blood of the aorta, the right by that of the pulmonary artery, and consequent congestion of both of these chambers and of their respective auricles; in the *fourth* place, deficient supply of blood to the veins of all the tissues and organs, and consequent fulness or accumulation in the arterial tubes and their capillary division with venous emptiness and exhaustion; in the *fifth* place, with difficult and imperfect transmission of blood through the pulmonary capillaries, deficient, limited, and inadequate aeration of the blood, and consequent deficient supply of renovated blood to the pulmonary veins and left auricle; and *sixthly* and *lastly*, the gradual deprivation of the blood of its healthy properties, its consequent transmission to all the tissues, or its detention in them, in a state of progressive deterioration, and its consequent incapacity for the maintenance of the appropriate functions of the various organs.

It is necessary, while treating this subject, to advert to an objection urged by Buffalini against the universality of this affection of the capillary system for which I contend. This author, in an excellent work on the Principles of Pathology, maintains, that it is impossible to imagine a morbid power, which at the same instant strikes all the points of the organic frame, and inflicts on all a simultaneous lesion, and he thinks it more rational to admit that the operation of noxious agents is first local at the point which it touches, and thence is diffused to others, and thus proceeds until it becomes universal.

Buffalini, however, forgets in this objection, that the morbid cause, whatever it be, really first affects a single tissue or system of the organic frame, viz. the vascular or capillary, and that the disorder which it thus engenders progressively affects all those organs into which the vascular system is distributed. It is, in short, not the substance of the brain or spinal chord, properly speaking, not the mucous membrane of the alimentary canal that is injured or disordered in Fever, but it is the vascular or capillary net-work of these and other tissues in common, that is disordered; and it is by virtue solely of the blood-vessels of these parts that their properties are impaired and their functions become deranged. It is, in short, solely by its isolated character as to organic sensibility, and by its extensive, minute, and multiplied distribution in the various tissues and organs, that the capillary system performs this important part in disease as well as in health. By its anatomical distribution in the different organs, and by its subserviency to their respective functions, the capillary system cannot be deranged or injured in any manner without proportionate disorder of the functions of those organs in which it is distributed.

After these explanations, it is almost unnecessary to advert to the hypothesis of Nervous Debility, so liberally and vaguely employed by Cullen and his adherents. The lesion of the nervous system in Fever, that is to say, the lesion of the brain, *cerebellum*, spinal chord, and nerves, is due exclusively to the capillary vessels of these parts becoming unable to transmit their contents, or to maintain the circulation, and hence to a degree of accumulation, which takes place, and gradually but certainly impedes or extinguishes the functions of these parts. This is rendered so much more efficient by the simultaneous lesion of the pulmonary circulation, in consequence of which an imperfectly respired blood is transmitted to the brain, in common with other organs. This imperfectly respired blood, with the arterial congestion and venous emptiness, and the want of the usual tension and support to the different organs, but especially the brain and spinal chord, constitute the true pathological cause of the Nervous Debility which makes so conspicuous a figure in the theory of fever given by Dr Cullen. The energy of the cerebral substance is impaired, not directly but indirectly, by the state of its circulation.

It is further quite superfluous to assume, as Broussais and his followers have done in Fever, a specific affection of the gastric and gastro-enteric mucous membrane. In short, it must be manifest to any one who understands the anatomical distribution and physiological uses of the capillary system, that, by admitting disorder of that, we have a state quite adequate to explain the phenomena; and it is at variance with the principles of sound philosophical inquiry to assume the existence of a state or states which are not only superfluous, but inadequate to the purpose anticipated.

It is further interesting to advert to the manner in which this state of the capillary vessels is gradually abated, extinguished, and removed,—in other words, to the natural cure of fever.

It has been already admitted that the capillary vessels possess certain properties by virtue of which they transmit to the veins the blood conveyed into them by the arteries. In the young, the vigorous, and those without serious lesions in the vital organs, the capillaries retain so much of this property as, under the use of proper means, to contract, and eventually transmit their contents to the veins. From the changes observed in the living body in favourable cases, and the appearances found especially in the arterial system, after death in fatal cases, there is further reason to believe that the circumstances on which the facility of recovery principally depends, are the incomplete fixation of the blood in the capillaries and arterial division of these vessels, and, consequently, a certain degree of natural fluidity, and some remains of the power of transmission in the vessels themselves.

It is at least certain, that, with the abatement of the stupor and incoherence, the complexion is invariably observed to lose its dull, dingy, sallow tint, and to become clearer; the eye is observed to get rid of its suffused muddy aspect; the petechial *stigmata* and spots become brighter; the pulse becomes slower, fuller, and less oppressed; the bowels more easily acted on by purgatives, and even considerable quantities of bile and urine may be discharged; and, at the same time, the sense of epigastric oppression and anxiety is abated or recedes. The skin is in general the last organ which acquires the full performance of its functions; and it sometimes continues dry and harsh for several days after the circulation and secretion of the other organs are almost completely established.

In general, I think, the lung is the organ in which the capillary circulation begins first to resume its natural activity. If a number of fever patients be observed, in various stages of the disease, either with their senses still partially preserved, or in a state of *typhomania* or stupor, it will be found that the first improvement takes place in the respiration, which becomes slower and fuller, and less hurried,—and that, in proportion as this function begins to be re-established, insensibility and delirium abate, the countenance and eye become clearer, and the pulse softer, fuller, and less frequent, and more free in action. In some of these cases, I have thought I could almost observe the blood drawn by the large inspirations into the pulmonary artery and the right chambers of the heart, and the brain and alimentary canal, in the same proportion relieved of the load by which they were oppressed. It is at least certain, that, when the current of the circulation thus resumes its natural course, the returning consciousness and sense of extreme weakness indicates not only that the capillary vessels are beginning to be emptied of their unnatural load, but that the veins are rapidly draining them, and conveying their blood to the right ventricle and lungs. Conversely, the fatal event is most usually accompanied with augmented oppression and obstruction of the respiratory motions.

The foregoing facts on the morbid anatomy of fever may be useful, however, not only in explaining the pathology of that disease, and the mode in which recovery is effected, but also the manner in which it terminates fatally, and the circumstances which determine that event.

I have already, in considering the progress of the dynamic disorder of the vessels in fever, attempted to explain the mechanism as it were of the gradual change in the function of circulation by which all the organs, and especially the brain, are slowly and progressively, but certainly asphyxiated. I have now to add, that both recoveries and morbid inspections concur in establishing the fact,—that Fever is a dynamic disorder entirely; or, in other words, consists simply in temporary derangement of function. Without dwelling on the obvious character of the evidence obtained from the circumstance of recoveries, I may advert particularly to the concurrent one, that in several fatal cases, not many, indeed, inspection shows no appreciable anatomical lesion adequate to account for the extinction of life. There may be no subarachnoid infiltration,—no effusion into the ventricles,—no hepatization or infiltration of the lungs,—and no serious change in the mucous membrane of the stomach or intestinal tube. It then comes to be a question, in such circumstances, what tends to induce the fatal termination? Many pathologists since the time of Hoffman, Rega, Cullen, and Whytt, represent the cause of death in such circumstances to be the shock inflicted on the nervous system by the poisonous principle of fever; and by many pathologists of the present day, this explanation is admitted and repeated as valid and adequate. I must avow my incapacity, nevertheless, to perceive the conclusiveness of this doctrine, when I do not understand how the nervous system is particularly or peculiarly affected in fever, and when both symptoms during life, and inspection of the organs of the dead body, show every tissue and organ, from the skin to the bones and marrow, to be as much affected as the brain and spinal chord. The same circumstances, I conceive, further justify the conclusion, that the mere general dynamic oppression of all the tissues and organs may enfeeble, impair, and suspend their functions so much as to be incompatible with the continuance of life; and that this will most readily happen when the veins and venous division of the capillaries are so emptied and exhausted as to be inadequate to furnish the necessary tension and support to these organs, and especially the brain and heart, and when their substance is at the same time overpowered by a load of dark-coloured blood, stagnating in the arterial division of the capillary vessels.

It is chiefly, however, in those whose organs are otherwise unsound, and whose vessels are enfeebled, that this result takes place. Among all the deaths in the male and female fever wards under my own care, only one instance took place in a young person,—a boy of about 12. Though I do not say that young persons never die of fever, the observation of numerous fever cases leads, I think, inevitably to the conclusion, that death is comparatively rare below 25 or 30 years. Among the fatal cases which took place in the male and female patients in the Fever Wards under my own care, the following were the ages. One boy at 12; one at 24; one female at 30; and one male at 30; one male at 34; two at 35; one at 39, one at 42, one at 43, one at 53, one at 56, one at 62, one at 66, one at 74, and three with ages unspecified, but all of whom were evidently between 38 and 48.

The reason of the death of the boy, Hugh M'Coll, at the age of 12, deserves notice, especially as the circumstances tend to illustrate the influence of predisposing causes. The individual in question was the child of a dissolute and irregular pair, both addicted to the use of spirits; but the father extremely idle, and rarely contributing so much as was adequate to sustain his family. To supply this deficiency, the mother was in the habit of acting as laundress to families, in the course of which she not only neglected the regular preparation and distribution of food to her family, but substituted for it, both to herself and children, an allowance of spirituous liquor. The usual breakfast and supper of the boy was a penny loaf and a mouthful of whisky. In this state of irregularity, and consequent indigence, the whole family were resident in the House of Refuge, when the boy was attacked with symptoms of fever, and consequently sent to the Royal Infirmary on the 20th September 1833.

His appearance indicated not only a feeble and puny state of the corporeal frame, but deficient energy to resist the process of fever. Yet the pulse was full and quick; the skin, especially the scalp, was hot and dry; and there was a sense of painful constriction over the frontal and temporal regions, with inability to raise the eyelids, and great suffusion of the eyes.

The scalp was shaved, the calomel bolus was administered, and ten leeches were applied to the forehead on the 21st; and next day the head was less painful, and the eyes were less suffused. On the 23d, however, the suffusion was aggravated; and with hot skin, and a pulse at 124, there was some shortness of respiration and cough. On the 24th, he complained of pain in the left side, immediately below the left pectoral muscle, which was aggravated by pressure, but not by moving the arm, with pain in the arm-pit and left umbilical and epigastric region; while respiration was performed on the left side, with sonorous *rhonchus* above and occasional sibilism below, inspiration preternaturally rapid, and the action of the heart unusually strong and jerking, with the countenance rather pale. Twelve leeches were applied to the left side of the chest and the epigastric region, the discharge from which entirely removed the pain, but left so much weakness, that he was ordered one ounce of wine every hour, and a mixture containing some spirit of nitrous ether. He felt much better, and the pulse was reduced to 100; and the respiration was void of *rhonchus* or sibilism. The bowels were rather constipated. After continuing for about twelve hours more in the same state, complaining much of pains in the limbs and knees, with some vomiting, which was checked by the use of beef-tea and small doses of the sedative liquor, he died the following day at 6 P. M.

Inspection was not permitted. But I think there is every reason to believe, that some organic change would have been found in the left lung, and perhaps in the intestinal tube. At all events, the case illustrates forcibly the pernicious effects of the habitual use of spirits in a person so young, in impairing the energy of the vessels and of all the tissues, and rendering them unable either to resist the influence of morbific agents, or to bear the use of the remedies indicated.

In young and otherwise vigorous subjects, indeed, fever will rarely become a fatal disease; and I think the inspections, both of this season and of previous ones, justify the conclusion, that not only the intensity and virulence of the febrile symptoms, but the fatal issue, are very much influenced by the existence of previous lesions in one or more of the vital organs.

Thus all the fatal cases which were inspected, presented lesions either of the lungs, or the liver, or the intestinal tube, or both; and there is reason to believe that in the fatal cases which were not inspected, similar changes, which might have produced the same effect, and tended to the same issue, would have been recognized. In these persons the previous existence of an organic, or even a dynamic lesion, more or less considerable, by impairing the functions of the organ in which it was seated, operated, in the first place, as a predisposing cause; and, secondly, when fever was actually established, it aggravated all the symptoms, gave a peculiar character to the disease, and constituted a most serious impediment to the action which consists in recovery.

The influence of these lesions must be readily understood by any one who is aware of the necessity of healthy structure of the organs for the due performance of their functions. In a person of sound organs, Fever, there is reason to believe, never assumes a very virulent or intense character. The capillary vessels of all the organs, uninjured by the vicinity of unhealthy structure, and with their own properties more or less entire, after a few days of deranged action, under the influence of the abstinence and cooling drink, to which the patient naturally has recourse, though at first inadequate to contract on their contents, gradually begin to do so, and, aided by the minute veins, propel the accumulated blood in its proper direction to the lungs, which at the same time, if in a healthy state, resume their functions with energy. The blood sent by the aorta is then gradually renovated by the addition of more completely aerated blood, which eventually tends to restore the energy of the circulation in the several organs.

When, however, all the organs are in the state described in the case of the man Macgrowther,—or when the lungs are in the condition described in Cookson, Wilson, and Weir,—or when the intestinal mucous membrane is in the state in which it was in the cases of John Boyle and James Brand, it is manifest that the chance of recovery is diminished, as I have stated in last Report, by the whole amount of the function of the affected organ in the animal economy. The cases of such persons are exactly as if they were, when attacked by fever, void of part or the whole of a lung, or void of part of the intestinal tube. The extreme degree of change of structure in the lung observed in the three cases now mentioned must be so much more detrimental, that, when the pulmonary capillary circulation is under the influence of fever, these vessels must be infinitely less able,—indeed, must be completely unable, in such induration of the pulmonic substance, to recover the power of circulating the blood of the pulmonary artery, and, consequently, unable to contribute to the restoration of the circulation.

How little can be effected by any remedies in such a state, and especially how little good can be done by wine and other stimulants, so frequently exhibited in this class of cases, it surely is unnecessary for me to spend time in showing. With a mass of indurated lung, or even with purulent infiltration of its tissues, the administration of wine or spirits is more likely to be detrimental than beneficial.

Nor are the milder cases, in which there is merely general congestion of the pulmonic tissue and vessels, and of the bronchial membrane, more likely to take a favourable termination. In the class of cases in which the bronchial membrane, and occasionally the pulmonic tissue, have been congested, and their vessels subjected to habitual distension, either by repeated attacks of bronchial inflammation, or by long-continued catarrh, aggravated too often by improper treatment, and the habitual use of spirituous liquors and errors of diet, the pulmonary capillaries, when enfeebled by the atony or *inertia* resulting from fever, are still less able than in a state of the bronchial membrane otherwise sound, to resist the influence of general deranged action, and transmit their contents for the purpose of aeration ; and, consequently, recovery is still more difficult, and almost impracticable.

Such especially, I conceive, to have been the principal cause of death in the case of the patient Niel Black, aged about 38, who was admitted with symptoms of fever on the 17th March, with a pulse at 146, subcrepitous rattle in the middle and lower part of the chest, difficult respiration and incomplete inspiration, much epigastric pain, suffusion of the eyes, and tendency to delirium. It was the ninth day at least of fever; and death took place on the 20th of March, that is, on the twelfth day of the disease.

Upon inspecting the body on the following day, it was observed that both lungs, in their posterior and inferior regions, were much condensed; in some parts of an ash-gray colour, and very firm; and in others of a deep-red tint, and soft in consistence. The bronchial membrane, also, was much reddened, and in some parts œdematous and softened.

The appearances now enumerated indicate the previous existence of a lesion of the bronchial membrane, of old date and long standing, giving rise to partial consolidation of the pulmonic tissue, and rendering respiration less free and perfect than health requires. Such a state of the bronchial membrane was quite inadequate to resist the atonic injection and vascular accumulation of continued fever; and the patient accordingly sunk rapidly.

This man, I may mention, was by occupation a marble-cutter, and much addicted to the use of spirits. Could minute particles of the marble have been inhaled, and irritated the bronchial membrane, or was the mere circumstance of working unsheltered from weather sufficient to induce the chronic bronchial disorder?

I cannot quit this subject without adverting to the marks of disorganization occasionally found in the brain by various physicians from Chirac, Home, and Pringle, down to Eisfeld and Jemina. Every one must perceive that these lesions are at present much less frequent than they are then represented to be, and much less frequent than lesions of the lungs. Are we entitled from this to infer, that malignant *Synochus* or *Typhus* has changed its character? It is manifest, that, in the cases in which suppuration of the brain occurred, there must have either been some previous tendency to this lesion, or that the fever must have been conjoined with cerebral inflammation. Has the treatment of fever, formerly observed by means of heating medicines, cordials, and remedies styled *alexipharmic*, had no influence in determining these cerebral suppurations; and has the more general employment of remedies, at least of a less stimulating character, if not absolutely depleting, tended to diminish much the contingent occurrence of cerebral disease. One fact may be regarded as established in regard to *Typhus*, viz. that it now presents fewer of those marks of capillary disorganization than formerly, and that it is a disorder of a more inflammatory character than that described by Huxham, Pringle, Monro, and Grant.

IV. TREATMENT OF CONTINUED FEVER.—It has been long well ascertained that all the changes above specified as necessary to recovery take place most readily under the use of those agents which either prevent undue distension of the capillary vessels, or unload them when distended. Of this nature, are depletion of the sanguiferous system, either general or local,—medicines which act on the alimentary canal, its circulation and secretions,—medicines which act on the skin,—and medicines which act on the glandular secretions. The particular manner in which these agents were applied varied according to the stage of the disease, the character and symptoms exhibited by the patient, and their effect in alleviating the symptoms or restoring the functions to their natural state.

Depletion from the system at large was practised only in cases of young or middle aged robust subjects, with strong full pulse, hot dry skin, flushed face, suffused, injected eyes, throbbing of the head generally, some distension of the temporal artery, or with symptoms of thoracic congestion, or much pain and weight or oppression of the epigastric and umbilical regions. Its employment was further limited to the early stage of the disease, and was not employed after the tenth or eleventh day.

Its effect was in no case to shorten, as far as could be discovered, the course of the disease, but in all cases to mitigate the symptoms, to obviate the approach of bad or virulent symptoms of dynamic oppression, either of the brain or of the lungs, and to enable the other remedies to act with greater effect. This circumstance, indeed, leads me to remark, that the theory of the operation of blood-letting in the treatment of fever appears to be misunderstood, by expecting from it more than it is capable of producing. It can never operate as a direct agent; but as an indirect one, it may be rendered highly beneficial.

As the powers of the capillary vessels are impaired in proportion to the mass of blood which they have to transmit, and as it is impracticable to attempt to remove this disproportion, by augmenting the powers of the capillaries, the only mode is to diminish the mass to be moved, or, in other words, to deplete from the blood-vessels generally, so that when part is withdrawn, the vessels may be enabled to act on the residue. A quantity of blood, varying from 12 to 20 ounces, removed on the very onset of the disease, often not only diminishes the oppression of the chest and epigastric region, and the weight and throbbing of the head, but prevents the approach of that arterial congestion which forms so formidable a part of the distemper. To be efficient, however, this ought to be done at the first, as the evacuation has no power in unloading the capillaries, if performed late in the disease.

In the cases treated in the fever-wards of the Royal Infirmary, the fever had generally been of several days' duration, when the blood must have been long in the capillary vessels, and when, consequently, it was unsafe to practise this evacuation. It was confined also chiefly to the young and vigorous, whose vessels might be supposed to possess greater contractile power. In one or two instances in which it was employed in adult subjects, it was manifestly injurious.

Local bleeding, on the contrary, was much more generally used, and much more commonly beneficial. The blood was drawn most frequently from the forehead or temples, if there was pain, or from the occipito-cervical region, if there was much delirium or tendency to stupor, and from the epigastric region when it was tense or painful, or when there was much epigastric oppression. The effect of this evacuation was not only to alleviate and diminish sensibly this epigastric oppression and anxiety, and abate the tenderness and tension, but to render the intestinal tube more amenable to the operation of purgative medicines, so that, though large doses of calomel and colocynth or jalap had been given previously with little or no effect, as soon as the epigastric and umbilical tension and swelling were reduced by local blood-letting, the medicines operated powerfully, and even much smaller doses produced full evacuations. It not unfrequently happened, even, that one local bleeding was inadequate to produce the effect desired, and then two or even three depletions from the *epigastrium* or the umbilical region, according to the symptoms, were directed.

With regard to the use of cathartic and laxative medicine generally, the only peculiar remark which I have to offer is, that these remedies were most efficient, as already stated, after general or local depletion, and when the same medicines were not exhibited daily, but were alternated, so as to apply to the alimentary tube a different *stimulus* daily.

It has been long the practice of the physicians of the Royal Infirmary to administer the citrate of potass, or of ammonia, or the acetate of ammonia, as refrigerant diaphoretics. These were very generally employed, as the state of the skin or tongue seemed to indicate. In general, however, they appeared to produce little effect on the cutaneous surface, unless the alimentary canal was previously duly, efficiently, and periodically evacuated.

With the view of acting partly on the blood, and partly on the renal secretion, I frequently prescribed in congestive cases, powders consisting of carbonate of soda and nitrate of potass, in the proportion of ten grains of the former to five of the latter. Under the use of this remedy, combined with the periodical and regular administration of purgatives, the countenance gradually lost its dingy sallow colour, and acquired a clearer and more fluid tint, the eye became clearer and less suffused, and the urine became more copious.

Of all the means, however, employed to obviate congestive accumulation and stagnation of the blood in the vessels, I know not that any was, next to local depletion and the use of purgatives, more effectual than due attention to ablution of the skin by means of the warm bath, tepid sponging, washing with soap and water, and even the cold affusion, or cold applied to the head. The first, by removing impurities from the surface, tended to excite the circulation of the skin and promote perspiration; while the employment of the cold affusion, either on the person generally or on the head particularly, was of equal use in maintaining and exciting the action of the capillaries generally, and especially those of the kidneys, and obviating vascular congestion of the brain and its membranes.

Wine was given only at the close of the disease, when the symptoms indicated that the arterial congestion was abating or gone, and the veins were beginning to absorb the contents of the capillaries; and even then it was exhibited in small quantities, and according to its effects.

My reasons for this mode of administration it is perhaps requisite to explain. The effect of this and similar stimulants administered in the commencement, when capillary atony and arterial accumulation predominate, is to augment these states, and, consequently, the general symptoms of fever and distress. I never yet saw wine exhibited during the first seven days of the disease without augmenting the throbbing of the temporal arteries, the suffusion of the eyes, the flushing of the face, and the distension within the head, aggravating or inducing delirium, and rendering the respiration preternaturally rapid. If continued, it generally induced or aggravated the already existing congestion of the pulmonary circulation, and thus injured the only function, the integrity of which was requisite to the re-establishment of the circulation. Administered, on the contrary, towards the close of the disease, when the capillaries were beginning to unload themselves, and when the veins were draining these vessels of their contents, the vinous liquor entering the veins is circulated with their contents, and not only rouses the heart and lungs to fuller and more energetic action, but not unfrequently gives to the organs the support and tension, which they begin to require at this stage of the fever. It is then, and then only, that wine abates delirium, prevents fatal syncope, and renders the pulse softer, fuller, and less frequent.

Of the justice of these views, the cases treated in the Fever Ward afford many apt illustrations. But my limits will not allow me to mention more than one.

William Taylor, a delicate-looking boy of 14, was admitted on the 29th September with the usual symptoms of fever, with headach, and much epigastric pain and distension. The head was shaved, purgative medicine administered, and blood was directed to be drawn from the epigastric region, by the application of twelve leeches. The following day, after the depletion, and the operation of the cathartic, the pulse was reduced to 108, but was small; and he had no complaint except that of feebleness and pains in the limbs. The treatment was now confined to the regular evacuation of the bowels, the application of cold to the head, fomentation of the feet and legs by cloths wrung out of hot water, and the saline ammoniated mixture.

On the 3d of October, when he seemed rather feeble, I was tempted to try the effect of four ounces of wine, which was continued that day and the ensuing one, without removing the weakness either of the pulse or the voluntary motions, while the tongue was evidently rather more furred.

On the 5th, the eyelids were forcibly and almost spasmodically closed, the eyes were a little suffused, the face was slightly flushed, and the scalp was hot, while the patient seemed generally restless and irritable. The wine was instantly withdrawn; ten leeches were directed to be applied to the temples; and the colocynth pill with calomel was ordered to be administered. The following day the restlessness, heat, and intolerance of light were diminished; and by causing the bowels to be duly and periodically evacuated, the febrile symptoms subsided slowly but steadily.

In the management of fever with *bronchitis* or *pneumonia (Pneumonia Typhodes)* this mode of treatment was somewhat modified. It was then impracticable to deplete largely; while it was requisite to control at once the local inflammation, and to subdue the febrile symptoms. In cases of this kind these objects were attempted to be obtained by drawing blood from the chest by means of leeches, or cupping from between the *scapulæ*, the exhibition of calomel and opium, or occasionally of large doses of tartrate of antimony. The application of blisters to the parts of the chest, most evidently indicated to be affected, was also occasionally employed with benefit; but the frequency with which any violence offered to the skin gave rise to *erysipelas*, rendered me averse to the use of this measure, unless under urgent and indispensable circumstances.

According to this system were treated such cases as that of Robert Dickson, John Macgarrity, and James Macmillan,—all examples of well-marked combination of *Synochus*, or rather *Typhus*, with peripneumony and *bronchitis*.

In the first case, in which the expectoration was of the orange-coloured kind already mentioned,—and with the subcrepitous rattle in the centre of the right lung, and dulness on percussion,—18 ounces of blood were drawn from the arm, which quickly presented an orange-yellow buffy coat slightly variegated, yet without any serum after a lapse of 18 hours. The pulse fell from 104 to 96, and was less tense and less oppressed. The respiration was 40. The chest emitted a dull sound from the centre of the right lung downwards; and a rasping sonorous *rhonchus* was heard by the stethoscope. The bowels had been freely opened by means of calomel and jalap.

Twelve leeches were now directed to be applied to the right side of the chest, the bleeding from which had the effect of relieving the pain of the side, and reducing the pulse to 80. The respiration, however, continued at 48, irregular, chiefly diaphragmatic, with bronchophony, but the subcrepitous rattle gone. As he complained of pain in the left side and in the epigastric region, blood was directed to be drawn from these parts by means of 12 leeches; the purgative enema was ordered, and an antimonial opiate at bed-time.

On the following day, the 17th, when there was still pain of the right side, and the respiration at 48, four grains of tartrate of antimony in two ounces of water were administered, and ordered to be repeated, unless the respiration became much easier. This produced squeamishness without sickness or vomiting, and much relief of the pain, reduced the respiration to 32, and rendered the skin moist and perspirable. The pulse was 96.

In the evening, when there was some return of pain and weight, the antimony was repeated with the same effect; and after this he had no complaint but slight sore throat, which soon subsided. The respiration fell to 28 and 30; his cough abated, and strength returned slowly; and after some treatment directed to the bowels, he went out on the 16th February.

The case of John Macgarrity, admitted February 2d, was treated much in the same manner, and with the same general effects. But it presented this peculiarity, that, after the febrile symptoms were completely removed, and he was walking about the ward, it left an intense disorder of the lungs, indicated by frequent hard cough; pulse at 90, strong, and hard; pain and weight in the chest, with some indistinctness of vesicular respiration and flushing of the face. For these symptoms he repeatedly lost blood from the arm and from the chest by leeches, had blisters applied, and took a mixture of squills and antimony, and even had emetic doses of ipecacuan and antimony. Under these remedies, after he had continued long in a precarious state, he went out well on the 21st May, and has continued since in comparative good health. This man, however, I have reason to believe, has some thickening of the bronchial membrane and induration of the pulmonic tissue, or perhaps minute tubercles disseminated through the lung.

The case of James Macmillan, aged 25, admitted on 29th July, was still more serious than either of these, in so far as not only were the symptoms of the pneumo-bronchial affection obscured by those of the Fever, but those of the Fever were obscured and complicated by *typhomania* and spectral delirium, occurring in a habitual dram-drinker. To detract blood from the system in such a case was unsafe; and the evacuant measures were therefore confined to local bleeding by leeches and cupping, evacuation of the bowels by calomel and jalap, the diaphoretic and diuretic effects of the *aqua acetatis ammoniae*, and sweet spirits of nitre, and the cream of tartar water, with one grain of antimony in the pound. Under the use of these agents, in the course of six days, the brain became clear, the respiration natural, the pulse fell to 84 and 80; and he was able to quit the house in the course of ten days after.

This man exhibited, however, a sort of fanciful delirium, and incoherence of thought and imagination, for some time after the other symptoms had quitted him. It appeared to originate in, and turn upon, some imagined infidelity of his wife.

The effect of the emetic tartar in the two former cases, and in others in which I employed it in the large dose, with a small proportion of solvent, was very remarkable. It was followed by slight squeamishness, with general copious warm moisture of the skin, great alleviation of the difficulty of breathing, which also became fuller and less frequent, and greater fulness of the pulse. The only inconvenience which appeared to follow it was a painful and tender erythematous redness of the pharyngeal membrane and *uvula*, lasting for about a week. In one case I saw superficial ulceration take place.

I have now only to mention the number of cases treated, and the comparative number of deaths.

In the general list already given, the number of cases treated is stated too low. I find that of the patients treated in the female ward from October 8th to December 25, when I ceased to have the charge, there were 48; and of these 4 died. One, viz. Sharp, died of erysipelas of the head, supervening on fever with meningeal effusion; one from an internal strangulation of the ileum; one from phlebitis consequent on blood-letting; and one from fever with abortion.

In the men's ward I had charge of the cases at two separate times,—first, from the 8th October to the 15th November; and secondly, from the 15th December 1832, to the 8th October 1833. During the first period I did not mark the number of cases regularly, as I was acting for another gentleman. During the second, the total number of fever cases amounted to 126, of which 22 terminately fatally.

Of these fatal cases we were allowed to inspect only eight; and the inspection showed death to have arisen not from the fever alone, but from that concurring with the previous morbid state of the organs.

In one case, Boyle, there was ulceration of the colon; in one case, Brand, ulceration of the *glandulae agminatae* of the *ileum*; in one case, Black, there were distinct traces of chronic *bronchitis* and peripneumony; in one case, Cookson, peripneumony of both lungs in the third stage, with enlarged cirrhotic liver, and diseased kidneys; in one case, Wilson, marks of chronic *bronchitis*, with solidification of the lungs approaching to pulmonary apoplexy, and much effusion of interstitial coagulable lymph; in one case, Weir, perfect consolidation of the centre of the left lung; in one case, that of Macgrowther, there were manifest traces of chronic *bronchitis*, with general enfeeblement of the vascular system all over the frame; and in one, Peter Paterson, the liver and kidneys were much diseased, and the duodenal follicles were enlarged and indurated.

In the other 14 cases not permitted to be inspected, though we have no direct evidence that the organs were diseased, there is little reason to believe that they were perfectly sound.

It is proper to mention, that, of these 22 cases, the majority were admitted at so late a period of the disease, that little room for active treatment was left. Thus the man Macleod was admitted on the 1st February, and died on the 4th. James Weir, æt. 60, was admitted moribund on the 27th September, and died the same evening; and two or three others were admitted in circumstances equally unfavourable for recovery.

V. On the subject of Erysipelas, I have only to say, that it was, in all instances of that affection ensuing on fever, most successfully treated by the continued application of cold to the parts, either in the form of simple water, or in that of the vegeto-mineral solution, combined with the persevering use of purgatives, and occasionally antimonials. In several cases, particularly that of the patient Sharp, punctures were extensively employed; but I am not certain that they were beneficial. This woman, however, died of the affection of the brain and it membranes.

In several instances a very good method of stopping the progress of the spreading redness and swelling, and of always mitigating their severity, was found in inclosing the affected patch or patches of skin by a broad line of nitrate of silver drawn very freely round the part.

In the case of a man of the name of Calder, who had previously had ophthalmia terminating in staphyloma, the erysipelatous action seemed to derive a new character from the morbid state of the eye and eyelids. The facial cellular tissue became inflamed, and began to suppurate diffusely. The skin was punctured: but incisions required afterwards to be carried into the cellular membrane to give vent to the matter; after which the disease slowly but steadily receded.

In the cases of primary erysipelas, as in that of Grace Thomson, the disease was treated by general blood-letting, purgatives, and antimonials, with the local application of the vegeto-mineral water.

VI. Cases of small-pox, both in the unvaccinated and in the vaccinated, were rather numerous.

The only point, however, of any interest, which deserves mention here, is the state of the tracheo-bronchial membrane in this disease.

A child of 2, named Hugh Campbell, was admitted on the 14th October with an eruption presenting the usual characters of small-pox, and after suffering much from difficult and oppressed breathing, with a small pulse, died on the morning of the 17th, like a person with a combination of laryngeal and bronchial inflammation.

Upon inspecting the body, I found the mucous membrane of the *larynx* and *trachea* much reddened and covered with viscid mucus. When this was removed, the membrane investing the arytenoid cartilages and forming the *rima glottidis* was observed swelled, reddish, and oedematous, contracting that aperture very considerably. The whole tracheal membrane from this downwards to the bronchial bifurcation and into the tubes was diffusely reddened; and the bronchial tubes were filled with mucus viscid above, more fluid and serous below. When the tubes were exposed, their membrane was also found reddened and vascular.

The substance of the lungs was gorged with bloody serum, and the vessels were much loaded with dark-coloured blood.

The right ventricle was much distended with blood, fluid, and in clots.

The mucous membrane of the stomach and bowels was lined with mucus, but in other respects not unnatural.

The kidneys were much congested with dark-coloured blood.

The morbid appearances in this case showed distinctly that the variolous action had proved fatal, not as is commonly supposed, by the shock inflicted on the nervous system, nor, as some other pathologists have imagined, by affecting the gastro-enteric mucous membrane, but by inducing laryngeal and bronchial inflammation, and thereby causing impeded aeration of the blood, and slow but certain *asphyxia.* It appeared to me, nevertheless, that the most essential part of this morbid action was seated in the bronchial membrane, and that the laryngeal inflammatory swelling was chiefly determined by the circumstance of the patient being an infant, at which time of life it is well known that the aperture of the *glottis* is comparatively smaller in relation to the calibre of the windpipe than after puberty.

Whether these views be well founded or not, however, there was reason to believe that the peculiar symptoms of malignity, or rather of mortal oppression of the internal organs, which were usually ascribed to the affection of the Nervous System, were due rather to the bronchial and pneumonic disorder.

Of the justice of this opinion I afterwards had a good confirmation in the body of an adult female who died of confluent small-pox in the Clinical Wards, under the care of Dr Graham.

This gentleman had requested me to conduct the inspection, which took place on a day on which he was engaged in particular academical business; and I found the following appearances.

The mucous membrane of the *epiglottis, larynx,* and *trachea,* down to the large bronchial tubes, was much reddened, and uniformly covered by a thin layer of matter, exactly similar to tissue paper spread over its surface. This matter was indeed not tenacious, and could not be detached by the forceps in patches; but small shreds of it could be scraped off by a blunt instrument, exhibiting the subjacent membrane red, raw, and vascular. The colour of this thin coating was reddish-gray; it was not semifluid; but in all respects uniform and like a newly prepared secretion. It resembled in some respects the coating described by Bretonneau and others in the disease of the mucous surfaces denominated *Diphtheritis*; but was thinner and more consistent.

The laryngeal mucous membrane in this woman was thickened, prominent, and a little infiltrated, but less so than that of the child Campbell.

In the bronchial tubes, the adventitious membranous covering was gradually or suddenly lost; but the mucous membrane was much reddened, vascular in patches, sometimes with arborescent vessels, and in some points prominent or swelled. The tubes were filled with fluid mucus.

The pulmonic tissue was infiltrated with much bloody serum, and was condensed and void of its natural elasticity, not collapsing as in the healthy lung. The vessels were loaded with dark-coloured blood, which was viscid and semifluid in the smaller branches, but fluid in the pulmonary artery and trunks.

The right ventricle and auricle were distended by much coagulated blood and fibrin. The left contained a little dark-coloured blood.

The gastric and intestinal mucous membrane was comparatively healthy.

The kidneys were much congested with dark-coloured blood; and their granular substance was irregular on the surface, and of a faint-yellow tint internally.

This woman, who was about 35 years of age, was rather a dissolute character, and had been in the habit of drinking as freely as her means permitted. She died in the early stage of the disease, before the eruption was thoroughly established; and, indeed, the symptoms had from the outset evinced a sort of oppression of the functions of all the organs, but especially those of circulation and respiration. The pulse was extremely small and feeble; the extremities cold; there was some stupor and slight delirium; the respiration was rapid and laborious, with limited, or checked and incomplete inspirations; and death was preceded by tracheo-bronchial rattling.

I think it is a just and warrantable inference, that the variolous action had in this case, as in the other, given rise to an extensive tracheo-bronchial inflammation, with secretion of a new product—the effect of which was to impede respiration, and consequently to induce those symptoms of adynamic oppression which consist in imperfect aeration of the blood, and consequent suspension of the circulation. If this inference be well founded, the supposed affection of the Nervous System in confluent small-pox and many other diseases, must be banished from Pathology; and its place must be supplied by chronic *asphyxia*, or, at least, death by deficient pulmonary circulation and aeration.

If further confirmation of the justice of these views were requisite, it might be found in the circumstances of a third case, in which, in John Lumsden, a young man of 24, after passing through the eruption favourably, the variolous action left a tender and irritable state of the tracheo-bronchial membrane, which speedily, on exposure to cold, passed into intense inflammation, proceeding rapidly to the fatal event. This, however, my limits will not allow me at present to give.

Art. II.—*An Account of an Endemic Fever that prevailed in the latter part of* 1833, *at Templemore, County Tipperary, Ireland.* By Richard Poole, Esq. 32d Regiment.

THE cases, though essentially of gastro-enteric fever, presented features differing from any others I have ever noticed. In a general way, however, this difference may be stated to consist in the intensity of the features rather than in any peculiarity they afforded. It is also to be observed, that the attacks were in a great measure confined to a certain class of subjects, namely, English recruits of full, or what is termed plethoric habits. In the epidemic that prevailed in Limerick, an account of which was published in the 118th number of this Journal, I cannot say that any particular class suffered more than another; while in this, the persons mentioned above composed at least nine-tenths of the number attacked. The weather, during the period the disease prevailed, was unfavourable to health, being remarkably moist, cold, and windy,—associations, though common in this country (Ireland,) very different from those to which the English are accustomed. With these remarks, I must conclude all I have to say on the subject of the exciting causes of the attack.

In my observations on the previous epidemic, I stated that the majority of cases were ushered in by no decided symptoms of disease. In this, the contrary appeared the most common mode of seizure,—the patients coming into hospital either with violent colicky pains, or incessant diarrhœa, with inappetence and general symptoms of pyrectic condition. I had every reason to believe that the diarrhœa existed in many cases some days previous to admission, and that the patients did not complain until the supervention of the other symptoms forced them. This, however, is nothing unusual,—a soldier generally bearing with many ailments without paying attention to them, while a trifling loss of appetite is always with him an urgent cause of complaint. Some of the cases, on admission, presented marked symptoms of what might have been well termed inflammatory fever; and I confess that in more than one I attributed all the phenomena to such a cause; and really, considering the subjects in which they appeared, the mistake was a natural one, especially when I found that some of the diagnostic marks of this fever were not awanting. In particular, I may mention perspirations, pains of the limbs and trunk, hemorrhages from the nose, white moist tongue, and a quick, largely developed pulse.

One of the fatal cases, (P. J. Butcher, 32d Regiment,) presented all these appearances in the extreme; and the patient denied that he had felt any inconvenience in the abdominal viscera, stating, also, that his bowels were much constipated,—circumstances which led me to exhibit, after general depletion, evacuant remedies, which in a few hours developed the latent disease; from that time to his death, uncontrolled by the treatment which appeared of paramount advantage in all the others. I cannot take it upon myself to state how far in such an event the irritation produced by the medicine operated; but this much has it taught me, that, in prescription, the epidemic constitutions demand consideration, nearly as much as the individual ones of the patients whom we have to treat. It will be seen, from what I stated above, that the modes of seizure might be divided into those cases which commenced as inflammatory fever, and those which were ushered in as diarrhœa; but as both of these, after a certain period, presented similar features, I shall here describe them separately only up to this point, when their histories will be given in conjunction.

The first form was the most common, and was attended with so few marks of deranged *primæ viæ*, that the seat of the disease might have been readily overlooked. The patients, however, exhibited considerable prostration and sense of weakness, and, although far from being without other sources of suffering, generally complained of this more than any thing else. Pains of the limbs, as already mentioned, and headach, with somnolence, listlessness, and anorexia, appeared very frequent. The pulse was generally much accelerated, but the skin was frequently moist, seldom hot during the day, but becoming so towards night, when it also frequently became dry. The tongue presented generally a thick coating of white or yellow fur; but, during the progress of the case, it became gradually cleaner, though remarkably red and contracted. Thirst was common; the desire being at first limited to tepid drinks, which, however, were soon abandoned for cold. The condition of the bowels was, in these cases, nearly uniform. They may be stated as having been sluggish, but active medicines produced violent effects; the evacuations were always feculent, some of them remarkably copious; but no relief followed their discharge. The abdomen was usually above the level of the ribs, and bore pressure pretty well in most parts, except at the epigastric and ileo-cœcal region; the latter was generally tender under pressure. There was at first but little flushing, except towards night. In one case, about a week after admission, there was remarkable tendency to collapse. The fever appeared to *form*, as it were, with difficulty; and, before it did so, the patient presented such anomalous appearances, that at one time he seemed moribund from complete exhaustion, at another comatose from apoplectic congestion. The patient was a Welshman, and gave but an indistinct account of his condition, which, without doubt, would have been mistaken, had not pressure over the first end of the colon invariably developed an expression of suffering. His pulse, until the fever set in, was at times barely to be felt at the wrist. It is singular that in this case, at its commencement, the symptoms I have stated as resembling inflammatory fever were very strongly marked. The case of Butcher, already mentioned, commenced with symptoms due to this division; but, as diarrhœa came on the day after admission, it will be better to include it among those of the other division.

With this exception, therefore, the cases under the second division were ushered in by diarrhœa,—at first of the contents of the bowels, and then of the secretions poured out either from the glands of the digestive apparatus, or the lining membrane of the canal. I cannot take it upon myself to describe the various appearances which the evacuations exhibited. In a severe case they were unquestionably melænic; in Butcher's they were for many days sero-bilious, consisting, apparently, of pure bile mixed with the mucous and serous fluids of the intestines. In several of the cases vomiting took place; the matter ejected was thick viscid bile, mixed with the secretions of the stomach. In two cases were presented at this time the most prominent symptoms of gastro-enteritis, in addition to those now mentioned; the abdomen throughout did not bear pressure, and the patients suffered constantly from violent and racking pains in its viscera. The sensibility of its surface was at times so much increased, that I was often induced to believe the serous tissue participated in the inflammation; yet no such inference was confirmed by *post mortem* appearances. The patients at this time were far from being prostrated; on the contrary, they were restless, anxious, and exceedingly alive to their situation, presenting in this respect a wonderful contrast to the others, who were remarkably depressed. The tongue was generally slimy and furred, but at times tinged with green or yellow, by the matter ejected from the stomach. The surface at this time was by no means heated to any degree, except at night, when accession was always discernible; sometimes it was cold and moist, with irregular distribution of warmth. The pulse was generally above 100; in a fatal case, for days it was upwards of 130; but only in one did it present any great degree of volume,—being, on the contrary, uniformly small, soft, and at times feeble and hesitating. The evacuations from the bowels amounted generally to twelve or fourteen in the twenty-four hours; but only in one case did there appear tenesmus; in fact, they were so copious and instantaneous, as frequently to be passed before assistance could be given to the patient to leave his bed. It is to be remarked, that, in some other cases, the diarrhœa existed without marked pain, but attended by most of the other features described above.

The duration of this preliminary stage, in both varieties, was from three to six days; a change then took place in the appearance of the tongue, the skin became uniformly heated,—the whole aspect of the case was altered, and the *fever* was ushered in by its peculiar features.*

The progress of the cases from this time was nearly similar in all, varying only in the degrees of intensity presented by each. This uniformity was not interrupted, even where there were characters sufficiently distinct to permit a division being made of them into two varieties,—founded on the parts of the intestine in which the disease appeared to predominate. The distinctive characters of these will be given hereafter. I shall proceed, therefore, to consider the cases in general, and to review their symptoms in detail, referring them here, as in my previous memoir, to their different localities. I consider this plan of describing symptoms to have peculiar advantages over any other. Their history is thus more connected; they are at once recognized to be distinguished by separate phenomena,—developed, truly, by a common cause, but springing from sources essentially different; and the degree of disturbance in which is frequently in the direct ratio of their intensity.

Cerebro-Spinal Apparatus.—The symptoms afforded by the viscera belonging to this apparatus were varied remarkably in the different cases, each of which appeared to be characterized by some that might be accounted peculiar to it alone. In a general way, however, it may be stated, that they were ataxic rather than adynamic,—a circumstance, it may be seen, affording a marked contrast with the former epidemic. In two cases the supervention of the cerebral symptoms was immediate, that is to say, appeared with intensity at once, without being preceded by any premonitory signs. They consisted of delirium, remarkably violent at night, and attended with constant endeavour to leave the bed, rolling of the head on the pillow, and general restlessness, a look of extreme wildness, with turgidity of conjunctiva, face, and forehead. In fact, these two cases might have served as examples either of *meningitis*, or inflammation of the cerebral substance. In both of them, it is worthy of remark, the scalp presented cicatrices to some extent, and other marks of former injuries of the head. In the other cases the appearance of the nervous phenomena was gradual; they consisted more or less of extreme restlessness, difficulty of keeping in one posture, headach, tremors of the upper extremities, wandering of ideas, muttering during sleep, and constant inclination to leave the bed. It was, however, rare to observe in the morning any great degree of irrationality in answering questions; but this frequently took place as the day advanced, and at night there was generally some difficulty in bringing the patients to understand what was said to them; it was then most frequently evident that their ideas were quite astray. Taciturnity, and dislike of being disturbed in any way, was a common feature, although sighing and moaning were attendant.

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* I use the term *Fever* here, to designate the specific form which it is my object in this memoir to describe. Phenomena, in all the cases, existed previously, to which the same term is applied; but as it was only from this time the disease assumed its proper and permanent character, it is necessary not merely to date its commencement, but also to restrict to it the only term in our language applicable to such a condition.

In a fatal case which occurred in the 5th Regiment, the ataxic symptoms were very prominent. These were biting the fingers or bed-clothes; twitching of the muscles of the face; rolling of the eyes; grinding the teeth; jactitation; occasional coma and somnolence, alternating with a state in which the patient was restless, fretful, and peevish; dilatation of the pupils; remarkable paleness of the conjunctiva and face, with an expression of great anxiety and suffering. This patient had been largely bled.

In a young boy of the same corps, other neuropathic symptoms were afforded, as screaming and uttering plaintive cries; constant opening of the mouth and gnashing of the jaws; shivering when the clothes that covered him were touched; and rolling about whenever his surface was touched in any way. These appeared quite involuntary, and the patient, when sensible, could assign no reason for their existence.

The nights, at the commencement of the fever, and for some time afterwards, were generally good, the patients sleeping, although talking to themselves and moaning; but, during its progress, a state of wakefulness supervened, and the patients, near the termination, passed the whole night in tossing about and attempting to leave their beds. In one or two instances marked prostration and apparent loss of strength appeared from the beginning; but this was so far from being the case generally, that most of the patients got out of bed when necessary, and seldom complained of debility, until long after the commencement of the fever. Profound torpor characterized the latter days of the fatal case of the 32d Regiment; the patient lay on his back, with his eyes turned up, apparently insensible to every surrounding object. It is not a little singular, that no other nervous phenomena were presented by this case, although the appearance of the brain differed little from that of the case of the 5th, in which these phenomena were so abundant. The man of the 32d was perfectly sane to his last moment; while the latter had been for several days previous to death completely delirious. It is to be remarked, that, as the cases proceeded, with the exception of those that proved fatal, the nervous phenomena gradually disappeared; but, at the decline of the fever, in some instances, they became again evident, although confined to muttering during sleep, and wandering of ideas when awake,—the patients often indulging in irrational conversation. This return of nervous phenomena at the decline of fevers, I have before frequently observed. I may here remark, that, in the two fatal cases, the morbid appearances presented by the cerebro-spinal viscera were confined to some slight vascularity of the subarachnoid membrane and white part of the brain, with some clear serosity above this membrane, in the ventricles, and along the medullary canal.

Circulatory and Respiratory Functions.—In a general way it may be stated, that, in most of the cases, some disturbance of the thoracic viscera existed, although in only two of them did it amount to serious disease, being confined otherwise to occasional cough, with slight mucous frothy expectoration, and some quickness of the respiratory movements, greater than is generally observed in febrile affections. One patient complained of tightness across the chest, and some pain, in all likelihood muscular, about the subclavian region, attended with cough and retarded expectoration, all of which yielded to mild means. The stethoscope detected some obstruction to the respiratory murmur in different parts of the lungs. These symptoms appeared shortly after the complete developement of the fever, and did not return after they had been subdued. In another case, very considerable *bronchitis* supervened when convalescence was setting in; but this also yielded to demulcent treatment, and counter-irritation with emetic tartar ointment.

In the fatal case of the 32d Regiment, the patient frequently laboured under cough, with some expectoration during the progress of the fever, but no other symptom, except a little quickened respiration, and occasional constrained posture, that would warrant the supposition of serious disease existing, until the day on which he expired, when he complained of pain about the lower part of the chest. On dissection, however, there was found a small portion of the posterior surface of the left lung in a state of hepatization, with some few *flocculi* of false membrane on its pleural covering.

I do not believe that this lesion contributed much to hasten the fatal result of the case; yet it is to be regretted, that the desire of sparing the patient the annoyance of an examination of the chest should have prevented its being recognized. In fever, however, pain of the chest, and especially about the lower ribs, even without any other evidence of disease, should never be disregarded, as it is often the only symptom afforded of serious disorganization in the pulmonary tissues. I have to mention that this symptom, with occasional expectoration of a greenish matter, offensive smell, and intense fetor from the breath, were the only phenomena presented by a case I lately witnessed, in which the lower lobes of both lungs were in a state of uncircumscribed gangrene.

Another case of the 32d is peculiarly interesting. This patient, for ten or fifteen days after the commencement of the fever, presented no signs whatever of pulmonic disease, and was apparently doing well, although his pulse kept at 100, and was remarkably full and sharp, notwithstanding most active general and local bleeding. One night, however, at the end of this period, he was attacked suddenly with most violent cough, attended with great hoarseness, but no other symptom of an affection of the lungs. The cough consisted of a succession of loud short shocks, particularly harassing, and was so aggravated at night as to prevent the patient enjoying a moment's rest. It was perfectly dry, the patient hardly ever expectorating a single *sputum*. It lasted from a fortnight to three weeks. At first both back lungs afforded very copious sibilant and sonorous râles, to which were afterwards added in the inferior lobes abundant mucous or serous crepitant; but, as the case proceeded, the former entirely disappeared, although the latter continued audible for a long time afterwards. Finally, however, these also vanished; but it was found that these continued after this obscurity of the respiratory murmur in the parts that had afforded them. It is singular that at none of these periods was there any expectoration, and most of the patients never had pain in the chest, and never appeared to labour under dyspnœa. I shall revert to this case, when speaking of the treatment, and will not take up more time at present with its details, only remarking, that its period of invasion and complete formation were not attended by any increased excitement of the general circulation.

In all the cases, for days after the fever was fully developed, the pulse at the wrist was rarely under 100. In some cases, as in Butcher's, it was upwards of 120; but in none, except the case in which the pulmonic symptoms just mentioned appeared, did it ever, during the day, give an impression of volume or firmness. On the contrary, it was at this time uniformly soft, compressible, and small; its rhythm was readily influenced by the movements of the patient; and in some it appeared irregular, intermittent, and with a peculiar hesitation in its beat. It is worthy of remark, that a single cough rendered it frequently so unsteady, that it was necessary to wait for some time after this ere it could be counted. In all the cases, with only one exception, the febrile accession, towards night, was attended with an increase of the volume and rate of the pulse; and it was at this time only that it ever presented any degree of firmness. The contrast between the pulse at the morning and evening visits was indeed a marked feature of the cases. In the case mentioned as an exception, (Butcher, 32d Regiment,) this order of things appeared changed, as the pulse in the morning was frequently twenty beats quicker than what it had been the preceding evening. The heat of surface was only considerable in the latter part of the day; but at this time it was always very great, and accompanied by much flushing of the face and forehead. Certainly, for one or two days after the commencement of the fever, there was considerable flushing during the whole twenty-four hours. But, in regard to the heat of surface, and many other points, the fever merited the appellation of remittent more than continued; for a person who saw the patients only in the morning would have formed a very erroneous opinion either of its form or its intensity.

Occasional perspirations might exist in the morning at the beginning of the attack, but, as it advanced, they invariably declined. As I stated before, the disease generally commenced with profuse sweats.

I may add here, that the blood drawn from the patients at the beginning of the attacks showed seldom a buffy coat; but the *coagulum* was generally very large compared to the serosity.

Digestive Apparatus.—It may be seen that the most violent symptoms due to the derangement of these important viscera appeared prior to the complete developement of the fever; yet, it must not be inferred, that, after this sets fairly in, there was an absence of striking phenomena. On the contrary, some of the cases to the last were marked by symptoms highly characteristic of the morbid conditions, and all of them without difficulty could be referred to two varieties already mentioned,—namely, one in which the disease predominated in the large, and the other in which it predominated in the small intestines. I cannot, however, undertake or deem myself able, to mention all the shades that distinguished these varieties, and shall be content with describing them together, and pointing out a few of the leading features that appeared peculiar to each.

The appearance of the tongue, as already stated, was a very striking character of the disease; so much so, indeed, as to point out with certainty the period of the invasion of the fever. In a general way, this appearance may be said to have consisted of intense dryness. But to this were soon added complete aridity of the whole mouth and fauces. The teeth became encrusted with black sordes, the tongue chopped and exceedingly painful. In one instance an ulcer of some size was formed under the frenum; and the patient complained of pain stretching along the whole throat, and shooting up to the head. After death, considerable redness was found in the upper part of the pharynx, with slight induration and ulceration of the tonsils. At first, the general colour of the tongue was red, but as the dryness increased, it became covered with encrustations, the colour of which determined, of course, that of the tongue. It is worthy of remark, that the dryness did not for some time after its appearance become permanent, until this, alternating with moisture; but, after it once became fixed, it remained so until the fever was on the decline,—this in some instances not occurring for clear twenty-one days. As in the former endemic, any new irritation during convalescence rendered the tongue again dry.

With this state of matters, existed intense thirst and anorexia; the latter, however, in some measure, yielding long before the other. Vomiting was observed in many cases, the matters ejected appearing bile, or some ingesta that had irritated. In one instance, shortly before the death of the patient, the attempt to swallow a little sago flavoured with wine, was followed by violent coughing, the patient being apparently too enfeebled to vomit. It must be allowed, however, that, with the exception of one case, vomiting was not a prominent or frequently repeated symptom. One patient complained of a sensation of tightness across the chest, which he said prevented him from swallowing; this is, in all probability, referrible to the state of the stomach, as was in another case, a feeling of lancinating pain about the left lower ribs.

The epigastrium in most instances was the seat of profound pain, and some of the patients appeared to feel very acutely any thing like firm pressure on the part. In a man of the 5th, this region was exquisitely sensible, and presented a regular throbbing, apparently in some way derived from the pulsation of the lower aorta. The ileo-cœcal region was also always referred to as a point of suffering, and pressure here always produced a complaint of pain. The course of the large intestines appeared also frequently highly sensitive. These pains sometimes lasted for two or three days; then disappeared under treatment; and again became manifest to be displayed in a similar manner. They appeared to me to be invariably attended by an aggravation of the other symptoms, and were therefore accounted indications of fresh irritation in the viscera. I was often led to believe, however, that other pains, from which the patients occasionally suffered temporarily, though acutely, were in a great measure occasioned by the intestines being in a state of distension from gas. The surface of the abdomen was never remarkably hot, and I constantly observed in the outline and consistence of this cavity considerable differences between the two varieties already mentioned. In the one, in which the disease appeared to predominate in the large intestine, the abdomen was generally under rather than above the level of the ribs; and I never perceived that it presented any degree of firmness or elasticity. In several of these cases, the abdomen was indeed very much depressed, and had a remarkably loose or flaccid appearance. In the cases in which the lower end of the *ileon* appeared, the principal seat of the disease, the abdomen, with one exception, was always on a level with the ribs, or in some measure above it; and in many parts of this cavity was it often easy to detect considerable resistance, as it were from firm bodies. I do not say that there was what is termed *tympanites* in any, but that all these cases, in the fulness and firmness of this cavity, presented a very great contrast with the other. In the case I mentioned as an exception, the abdomen was retracted almost to the spinal column; it was in this the throbbing at the epigastrium was perceived,—but here after death, were found at least three-fifths of the small intestines loaded with feces incarcerated firmly in the pelvic cavity.

The two varieties were also distinguished by the number and appearance of the evacuations. In the former, they were remarkably frequent, amounting to ten or twelve in the twenty-four hours. The matter discharged was rarely feculent, but appeared almost wholly fluid, of various colours, with some particles either of undigested ingesta or mucous flocculi. In three cases, for many days the evacuation consisted of a serous fluid, in which gamboge had been apparently dissolved. In all probability, it was this secretion covered with bile. I cannot expatiate more on this subject, but shall only add, that in this class of cases, there appeared nearly every sort of evacuation ever mentioned as unnatural. In the other variety, diarrhœa was not wholly awanting, but there never existed any thing like the frequency of evacuation noticed in the former, the bowels being seldom moved more than four or five times in the same period; in many of the cases, even this average is too great, and in some, constipation was observed. It is to be mentioned, that few of these cases at some time or another of this progress did not require assistance from opening medicine. The evacuations were rarely other than feculent; sometimes they had considerable consistence, being actually in one entirely scybalous. In the circumstances now pointed out, consisted the chief distinguishing marks of these two varieties, points of diagnosis that might be overlooked, as they were, probably, not always so distinct in the milder cases as they were undoubtedly pathognomonic of the intense. In some of the cases, sloughing took place from the nates and hips; blistered surfaces (how much do I regret any being made!) were long in healing; but in no case did there appear petechial or miliary eruptions. In one, a remarkable erythema appeared on the cheek and nose; it lasted for two days, and the case terminated fatally the day following. The duration of the cases until the fever began to decline was varied,—seldom less than twenty days, and in several it was thirty-one. It may be seen that, with the exception of the absence of all eruptive phenomena, the fever I have now described agrees in every respect with that recorded by M. Petit.

Treatment.—The treatment found most successful in this disease consisted of bleeding, general and local, the demulcent regimen, and sedatives. I shall proceed to detail it, reserving for consideration hereafter that which was tried without benefit.

The condition of the patients, the urgency of their symptoms, and, above all, the idea at first entertained of the nature of their disease, led to the employment of general bleeding in all the cases that presented at the commencement of the endemic. Some at its cessation appeared not to indicate its necessity. The remedy was unquestionably of service, not merely in preparing the way for local depletion, but in subduing the general plethora, and in equalising the circulation, by diminishing the intensity of the local engorgements. For the latter purpose, it had frequently to be repeated; but, in none of the cases did the number of venesections exceed three, and the quantity of blood abstracted at each seldom exceeded twenty ounces. I do not feel at liberty to state that the disease would have yielded as readily with a less abstraction of blood, as the symptoms appeared to me of sufficient severity to demand the most energetic treatment, and I was therefore not induced to abandon the remedy which we must always consider as the grand means for reducing inflammatory action, until I had produced by it a marked impression on the system. In respect of demanding the free use of the lancet, the present endemic differed widely from the former, which never exhibited any symptoms that indicated the necessity of general bleeding. Local depletion was invariably resorted to, immediately after the use of the lancet, and as often during the course of the fever, as circumstances required. In many of the cases this amounted to eight or ten times. The epigastric, ileo-cœcal region, course of the colon, and margin of the anus, formed the seat of local bleeding, as the symptoms indicated a predominance of the irritation in the subjacent viscera of each. When the head appeared affected, the course of the jugular, and the temples were selected, along with arteriotomy and opening the jugular. I am not warranted in saying that the fever was ever cut short by these means, or that any very marked change in it was ever discernible after this use,—for, in fact, the disease appeared to have a course to run which nothing prevented it from completing; but this much I found, that nothing subdued certain symptoms, and allayed local pain, and by consequence the general suffering, so much as the application of leeches, copiously, to the affected parts. I did not restrict the use of this remedy to the first stages of the disease. During its entire course I adopted it as a chief means of cure, and was never deterred, by any appearance of debility, from employing it when other symptoms indicated its use. I am not required, at this day, to indulge in any eulogium on the *virtues* of this remedy, in diseases of the gastro-enteric mucous surface,—an immense mass of evidence in its favour being long on record, and nothing from me at least can be needed to enhance its value; while, in fact, its warmest advocate is only required to say it has been used, to attest that its use has been beneficial.

A rigid abstinence from every kind of food was enforced for many days after the first symptoms of enteric disease, and the patient was confined either to plain lemonade or acidulated barley-water. It might appear that the former of these drinks was contraindicated by the state of the bowels. Such, I confess, was often my impression; but it was in vain to attempt restricting the patients to insipid drinks,—their constant demand being for something "tart;" and I never found such suspicions to be realized, as the diarrhœa was just as frequent without the acid drink, and as this was used freely by the other patients who had no diarrhœa at all. It was only necessary to prevent the patients drinking largely,—a task, at times, of no easy accomplishment. Acidulated barley-water may appear better adapted for such cases; but it was seldom relished,—in all probability from its being badly prepared. A military hospital is never remarkable for delicacy of cookery. When appetite began to appear, a little thin arrow-root without milk was allowed; at a proper interval this was added; and, by degrees, the patients ascended to sago or rice,—and then to chicken-broth or beef-tea. The greatest advantage was derived from this severe diet. The case was uniform in progress, when it was strictly adhered to, and relapses were only occasioned by a deviation from it. Some of the patients subsisted on it for thirty days, without exhibiting any tendency to collapse. It is to be understood, that it was only after the fever had been declining for some time, that the different broths mentioned were allowed.

I now come to the sedative part of the treatment, to which I am desirous to draw some attention. An attempt to derive benefit from it being made at different periods of the disease, I am enabled to give the results of some experience on the subject. The sedatives used in all instances were the preparations of morphia,—namely, the acetate and muriate. I used the former,—the medical officer in charge of the 5th Depot the latter.

Before the fever was developed, that is, during the existence of the violent symptoms described in the first part of this memoir, after general or local bleeding, the morphia was employed in several cases; and in none did it appear of the slightest service, although given in full doses. It produced, probably, a little sleep, allaying also for a time the abdominal pains; but it was never followed by any permanent remission either of these or the diarrhœa. It was therefore at this time abandoned,—particularly, as in three cases its exhibition was followed by bilious vomiting,—the consequence, in all probability, of the hyper-stimulation of the lining tissue of the stomach. These facts appear to confirm an observation of M. Broussais,—that opium reacts on all irritations, and that its use is invariably contraindicated, when the stomach is inflamed. It is, however, worthy of being known, that in no instance did it excite uneasy sensations in the cerebral apparatus.

These medicines were again tried during the course of the disorder; they excited vomiting in one or two cases, never restrained diarrhœa, nor produced any change in the fever. They did not, however, occasion any disturbance in the head,—but invariably produced some tranquil sleep. In all this, there was nothing to warrant their re-administration, and they were, in consequence, again abandoned.

When the fever had lasted long, the patients, I already mentioned, were distressed with wakefulness and many other neuropathic symptoms,—although the disease evinced no tendency to yield, as the tongue continued dry, the diarrhœa urgent, and other circumstances persisted. This led to the belief that no change had taken place in the character of the disease. In one case, indeed, I found, from the supervention of the nervous phenomena described, that some new irritation had been kindled in an important organ. At this time, and under such circumstances, sedatives were again used; and I was now agreeably disappointed by the result,—a remarkable improvement becoming apparent from the date of their exhibition. The tongue was found moist on the following morning, in three cases—the pulse fell 10 or 12 beats,—the patients enjoyed refreshing sleep,—and in every instance was a change made in the disease that evinced a tendency of the pyrectic condition to terminate. In fact, it may be said, that from this moment convalescence began, which was never relapsed from, providing the case was properly managed. The remedy, therefore, used at this stage, I consider as appropriate as bleeding at the others. In no instance did it produce constipation, —but in one, attended by five or six watery, gamboge, evacuations every night, the irritation of the colon was allayed, and, from the night on which it was first used, the patient passed formed evacuations, and never more than two in the twenty-four hours. The head was never affected. In most of the cases in which I used the morphia at this period, I commenced it during the day, with the view of being able to calculate the effects it might produce during the night. In furtherance of this, a grain was dissolved in mucilage, of which the patient took a twelfth part every second or third hour, until evening. It was then ascertained that it had produced much tranquillity, and a full dose, say a fourth or third, was given at night. This was at first sufficient to insure profound sleep. It was repeated for several nights afterwards, providing the tongue did not become again dry, which occurred in two cases after four nights' use,—when it was omitted,—the patients, nevertheless, continuing to enjoy a tranquil night's rest. The same medicines were also found of great service in allaying that excessive irritability and host of uneasy sensations depending on the sloughing sores on the hips and nates; under these circumstances, they were used in small doses during the day,—care being taken at bed time to exhibit a larger dose to produce sleep.

In the case in which the pulmonic symptoms appeared, I used the same remedy in like manner with the happiest effects, after every other had appeared ineffectual. During its exhibition, profuse perspirations were excited, but no secretion was checked to make up for the loss in this way, with the exception of that from the intestines,—the patient having had in addition to the pulmonic symptoms severe diarrhœa. Impressed with the idea, that this diarrhœa prevented secretion from the bronchial membrane, I administered the morphia,—thinking by checking the one to promote the other,—by which I anticipated relief to the pulmonic attack. The result of the experiment, though favourable, did not appear to be brought about by any such process, as no expectoration ever took place; but the cough gradually abated in violence, and at length, along with the stethoscopic signs, disappeared. I confess that I was unable to establish a correct diagnosis of the pulmonary affection; but it appeared most likely to be double *bronchitis*, with some engorgement of the back lung, owing to the long continued horizontal position of the patient. It is, however, not impossible that the mucous râles were the gurgling of softened tubercles, the matter of which was carried off by absorption. This view of the case is not opposed by the absence of expectoration, as we find every day cases of phthisis terminating, even fatally, without ever being attended by much excretion from the bronchial passages. I trust I have said enough on the employment of the sedatives to warrant the conclusion, that, under the circumstances mentioned, they were highly salutary.

The cases that were attended by a confined state of the bowels admitted and required evacuants. The medicines of this class used were, however, those that operated mildly, bringing away the retained secretions and feculent matter without causing sensible irritation to the mucous membrane, such as castor oil, manna, and *hyoscyamus*, aided by emollient enemata, the latter often appearing of the very greatest service. It was invariably made a point to procure the evacuation of the bowels at least once in the twenty-four hours, and I always found no difficulty in doing so with the means now mentioned. This closes my account of *juvantia*.

In some of the cases, mercurial preparations were used. I have to state positively, that in no instance was the least benefit derived from any of them, even the mildest, *Hydrarg. c. creta*. To say they did no good is to use the most qualified expression for their effects, as I cannot but believe that in more than one instance they did harm.

A stimulating plan of treatment was adopted in the fatal case of the 5th. The patient appeared to suffer no inconvenience from the use of wine and some etherized draughts, for he took them readily as often as they were given. It was evident, however, that sensibility to painful impressions was completely destroyed; the progress of the case also was rapid; and the dissection, which will be presently given, revealed a state of matters not at all likely to be benefited by such remedies. It is to be observed, that, for many days before death, the patient was quite delirious. In the fatal case of my own corps, I prescribed, the day on which it proved so, some sago flavoured with wine. The man at first refused to take it, as every attempt to swallow even a spoonful was followed by coughing; some hours previous to death, however, he swallowed greedily a tumbler of hot wine-negus, but nothing would induce him to take more. I have said enough to prove that this was no fever for Brunonian principles. In the cases in which blisters were used, men chiefly of my own corps, relief was never obtained by this means; on the contrary, they produced the greatest uneasiness, and I have no doubt added much to the general irritation. The want of leeches, more than my own inclination, was the cause of their being at all employed. In the fatal case of the 32d, a blistered surface remained open until the death of the patient, although it had not been made for twelve or fourteen days previously. During convalescence, in several cases, a relapse was produced by indulging in a too generous diet, and it was observed that the effects produced by this were long in being effaced.

From the following *post mortem* reports, the morbid anatomy of this form of fever may be understood. I need hardly say that the first is an example of the disease predominating in the stomach and large intestines; the second, in the stomach and small intestines. I have only to add, that both reports were drawn up immediately after the examination.

John Butcher, 32d Regiment. Duration of disease eighteen days, 9th December 1833.

Autopsy.— Semimarasmus of extremities.—*Head.* Considerable clear serum under the arachnoid; the membrane was pale and natural in appearance; subarachnoid slightly injected, especially in its arterial ramification; the superficial veins contained but little blood; slight serosity in the lateral ventricles; *plexus choroides* blanched; no blood at the base of the brain, but considerable limpid serosity in the cavity of the *medulla oblongata*. The brain was generally soft, presenting on incision many bloody points,—the cortical, however, by no means of a darker colour than usual.

An ulcerated spot of some extent was found on the lower surface of the tongue; and the tonsils were harder than usual. The lining membrane of the back part of the fauces generally appeared in some measure destroyed; but the colour of all these parts, with the exception of the back part of the pharynx, which was vascular, was pale. The œsophagus was normal.

Thorax.—External pulmonary tissues remarkably dry, the cavity contained no serosity, and the lungs were completely collapsed. They presented on several parts of their anterior surface small vesicles of air between their parenchyma and proper tunic; some of these air-bladders appeared to follow the tracts of the superficial vessels. Some loose soft fibrinous deposit under the left lung. The lungs were perfectly sound, with the exception of a part of the posterior surface of the lower lobe of the left, which was hepatized to a considerable degree, only containing a small quantity of air, from which, when pressed, some frothy blood-coloured serum oozed. The structure of this portion was essentially granular, and any parts of it sank in water. Slight hypostatic engorgement of the back part of the other lung. Pericardium externally very dry, some lemon-coloured serosity within its sac. The heart was normal.

Abdomen.—The peritoneum of the parietes and viscera was remarkably dry, but otherwise normal. The stomach was small, (contracted ?) external vessels very large, many of their minute ramifications injected. Its mucous membrane from the cardia to the pylorus, over its whole extent, presented intense arborescent vascularity; its rugæ were of a deeper colour, and appeared like dark bands traversing its surface. The membrane likewise presented spots of a dark redness, which, on close examination, were found to consist of patches of arborescent vascularity, more injected than the general surface. The membrane throughout was of a normal consistence and bulk; it resisted the brush of the sponge, and in some measure the scraping of the nail. The duodenum, the external vessels of which along four or five inches of its first portion were much injected, presented the surface of its mucous membrane smeared with bile, and intense injection of its capillaries over the same extent. The whole of the remaining part of the small intestines was remarkably pale, until a few inches above the end of the *ileon*, when the mucous membrane became again highly vascular, and probably a little hypertrophied from the developement, in a certain degree, of the muciparous glands. The ileo-cœcal valve was intensely vascular, and the cœcum and first eight or ten inches of the colon presented through the whole extent of their mucous membrane injection of their minutest vessels. The colour of all this was intense deep redness. The inner surface of the large and small intestines was smeared with a colourless fluid; but in none of them was there the least trace of feculent matter. There was no remarkable distension, and no fetor.

The liver was normal; the gall-bladder empty and flaccid; the pancreas a little indurated.

It remains to be observed, that the cranial cavity was first examined.

Case II.—John Elvidge, 5th Regiment. Duration of disease eleven days.

Autoposy.—Considerable marasmus. *Head*, some turbid serosity escaped on opening the cranium; slight effusion under the arachnoid; the subarachnoid was considerably injected; the superficial veins distended: the brain very sanguine and firm, with numerous bloody points, and small clots; the lateral ventricles distended with clear serosity; *plexus choroides* blanched. *Cerebellum* very bloody. Some effusion (serous) in the cavity of the *medulla*.

Chest.—Lungs normal, pushed up into the cavity by the distended colon; a little serum in the left pleural sac; hypostatic engorgement of posterior right lung; heart sound.

Abdomen.—The *peritoneum* was normal but dry.—Colon much distended; stomach of natural size; a large patch of a dark brown colour on the portion of the peritoneal covering that rested on the spleen. (In all probability this was hyperaemia from transudation.) External vessels not distended; intense capillary injection of the mucous membrane of the cardia; many spots of a dark-red arborescent vascularity in different parts of the great arch; this portion (the great arch) presented also a large patch, corresponding to that on the outer surface, of a dark brown hue. The membrane of this was soft and in a manner pulpy, as the sponge brought it off nearly in a fluid state retaining the same dark colour; some ramiform vascularity at the pylorus; first three or four inches of the mucous tissue of the duodenum highly vascular; two-fifths of the small intestines were incarcerated in the pelvis, from which it required some force to extricate them; the peritoneal surface of all this portion was highly vascular.

The *ileon* presented a uniform dark logwood colour of its mucous membrane, which was found to proceed from intense injection of its capillaries. The membrane was also very considerably hypertrophied, and studded with numerous irregular ulcers, the edges of which were ragged and elevated, the bottom consisting of the muscular tunic. All these ulcers exhibited in their centres a patch of a light brown substance, which resembled a small eschar; it was only with difficulty removed from the subjacent tissue, and all around its edges existed furrows of ulceration. About twenty of these ulcers existed, many of which were an inch in diameter. At the end of the *ileon* was presented a portion of the mucous membrane in an undoubted state of gangrene. A supplemental appendix existed about the middle of the ileon, the mucous membrane of which presented two small ulcers similar to those already described.

The mucous membrane of the cœcum presented slight vascularity.

The large intestines and the lower part of the small were filled with thick feculent matter.

The gall-bladder was full. The pancreas and spleen were firm.

December 20, 1833.

Art. III.—*Remarks on Beriberi.* By P. W. Wright, Esq. Assistant-Surgeon, Madras Establishment.

THE few treatises on this disease mention it as being chiefly confined to the Malabar coast and the Island of Ceylon. In this part of the Malabar coast, I have had ample opportunities of observing it during a residence of upwards of two years. Beriberi is, for the most part, a primary complaint, attributable to some peculiarity in climate and locality, and does not seem to be brought on by other diseases, whether acute or chronic. It makes its advances in an insidious manner, without any primary marked train of symptoms, the habit requiring to be assimilated by a certain residence within the sphere of action of the general and exciting cause. So that before the visible invasion of the disease, there appears to be a precursory stage, in which the indisposition is comparatively slight. The periods of infancy and boyhood are exempt; and females are seldom attacked.

I have observed the disease under several forms; but these, I conceive, may be referred to three general heads.

The *first* of these I shall call the severe or inflammatory, in which it is generally a first attack, the patient robust, and dropsical symptoms present, resembling what pathologists call acute or arterial.

The *second* is the asthenic, when the patient may have been worn out by some previous disease, or had a relapse of this,—not an uncommon circumstance, as one attack predisposes to another, and when the dropsical symptoms resemble those observable after protracted fevers, or other debilitating causes.

The *third* is what I shall call the local, from the disease appearing to be confined to the lower extremities, there being œdema and paralysis only of those parts, and no constitutional irritation.

The above, however, occasionally vary, according to the constitution of the patient, and the necessary hurtful circumstances; for there are instances where the patient has been admitted with local symptoms, and suddenly been seized with general acute anasarca.

To be more minute. In the first mentioned form, the patient on admission complains of having been for a short time previous incapable of exerting himself from a partial loss of the use of the lower extremities. This rapidly increases, till he finds that there is inability to walk, accompanied with œdema of the extremities, which soon becomes general. The skin is hot and dry, urine scanty and high-coloured, bowels costive, and stomach irritable, rapid and full, pulsations at the large arteries, variable at the extremities, accompanied generally with dyspnœa, and symptoms of effusion, in the chest; whilst at other times there is headach, restlessness, delirium with a slow and full pulse, indicating serous effusion, and pressure upon the brain. Here the progress of the disease is rapid, and active measures are required to check it. In the second mentioned form or asthenic, abdominal dropsy is most prevalent, accompanied with symptoms of general relaxation, small and quick pulse, constipated bowels, scanty urine, loss of appetite, general œdema, much pitting on pressure, and paralysis of the extremities, as in the former instance. In the third mentioned and most subordinate form the patient complains of numbness of the lower extremities, rigidity with a sense of weight and partial loss of their use; there is œdema only of those parts with slight pitting on pressure; there is no unnatural heat of skin; the pulse is seldom above the natural standard; the urine is scanty; and the appetite unimpaired.

Mr Hamilton observed the disease under two forms, one in which the symptoms were at first mild and increased in severity, and the other, in which they were at first urgent, increased rapidly, and generally proved fatal.

In Dr Johnson's valuable work on Tropical Diseases, the several treatises on Beriberi also mention the numbness, paralysis, and œdema of the extremities as being the leading symptoms, being followed by dyspnœa, oppression at the *præcordia*, and the patient being finally carried off with fever and delirium.

The etiology of Beriberi is but little known, and it would, I think, be difficult to defend an opinion as to the primary cause of that morbid train of associations which create it,—whether it may be attributed to marsh miasma, peculiar alternations in climate and temperature, or some noxious quality in the water of the district when the disease is endemic. It, however, appears to be most prevalent towards the end of the rainy season, when the night temperature is many degrees lower than that of the day. From the month of April to August last, the weather was permanently hot, and the admissions few. From August to December, there were heavy falls of rain, with occasional sultry days, when the alternations of temperature were greater, the exhalations more concentrated, and the admissions of Beriberi more frequent.

This district is plentifully supplied with tanks and other reservoirs of water for irrigation. The principal produce is consequently wet grain. Towards the sea there are several salt marshes, with considerable tracts of cotton ground, which being porous is very absorbent. Generally speaking, indeed, the soil of the country immediately around is of great depth, and very absorbent, so that the greater part of the periodical rains is retained, there being no large rivers to carry them off. It may be here also worthy of remark, that the most of the patients on their admission to hospital, when questioned as to their idea of the origin of this disease, invariably state that something noxious in the water they drink is the cause of all their sufferings. There are no fresh springs in the neighbourhood; and the water used for culinary purposes is generally taken from wells which, when frequently drawn, ought to be pure. Having filtered through a limestone soil, the principal solid ingredients in the water of several of the wells in this cantonment, are the sulphate and carbonate of lime, but in too small a proportion to be noxious. This disease is also equally prevalent in all the villages in the vicinity, in some of which the water used for culinary purposes is taken from tanks, some of which are brackish, full of weeds and animalcules; whilst others, the soil immediately around being composed of a red ferruginous substance, contain a reddish coloured water, with a slight astringent taste, and which is more free from any noxious animal or vegetable substance.

The Hindoo practitioners ascribe this disease to some morbific substance, with which the water and air become impregnated at certain seasons. The remedies used by them are stimulants, and carminatives, such as ginger, cloves, nutmeg, and other spices, made into a paste, Treeak Farook, warm applications locally, and burying the lower extremities in hot sand.

It seems a disputed point whether this disease is originally nervous and dependent upon some primary affection of the *encephalon* and *medulla*, or whether it proceeds from an original dropsical diathesis, dependent upon some disorder of the sanguiferous system. The latter I think the most probable, since the symptoms of diminished nervous energy are only secondary, and occasioned by engorgement of the venous vessels of the brain and *medulla*, and also by the pressure of serous blood secreted from their membranes; and because, as in most dropsical complaints, the serous part of the blood appears to be lodged in the cavities and cellular substance, whilst the veins are loaded with crassamentum. This is more applicable to that severe form of the disease attended with *dyspnœa* or *phrenitis*; whilst in the milder and more local form, the serous effusion and engorgement would seem to be confined to the lower part of the spinal marrow, causing paralysis only of the lower extremities, as it has been stated that paralysis of the lower extremities may be unconnected with diseased brain. * Moreover, the paralysis that is dependent upon disease of the brain or *medulla* is known to be rarely capable of cure; † whilst that which accompanies this disease yields generally to deobstruents and remedies which have power over dropsical complaints.

Morbid Appearances.—Dissections of this disease show that the patient is at times killed by suffocation from the increased pressure of accumulated fluid in the lungs, and at others by apoplexy, by the pressure of dark venous blood on the brain, accompanied generally with serous effusion. In most instances the venous system of the brain was found engorged without extravasation. There was serous effusion between the *dura* and *pia mater*, and at the basis of the brain. The same appearances were observable in the spinal canal, its vessels being engorged, with effusion from its membranes. There was anasarcous effusion throughout the body; and there was generally effusion in the cellular substance of the lungs. In one instance, where the patient had suffered much from dyspnœa, a considerable quantity of water was found in the cavities of the chest. There were also traces of inflammation in the lungs and *pleuræ*. Their vessels were turgid with dark-coloured blood, and the heart appeared flaccid and enlarged. In another instance, where the patient had suffered from *ascites*, there was general effusion in the cellular membrane; a large quantity of fluid was observable in the cavities of the abdomen, without any traces of inflammation of the viscera; there was also effusion in the brain and medulla without engorgement. In the milder and more local form I am unacquainted with the morbid appearances, but imagine that the serous effusion and engorgement are confined to the lower part of the spinal marrow.

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* See Thomas's Practice of Physic, p. 357.

† See Gregory's Practice of Physic, p. 355.

Diagnosis.—The most uniform symptom of this disease is the characteristic paralytic affection of the lower extremities accompanying all forms, and described by the patient as if the legs were insufficient to bear the weight of the body, the rapidity with which the œdema becomes general in the severe forms, and the dark ropy condition of the blood when taken from the patient, resembling in some degree the appearance of the blood taken from a patient affected with cholera. The other symptoms are common to this, as well as to other dropsical diseases, such as partial suppression of urine, diminished secretion from the surface, and the symptoms peculiar to dropsical affections of the abdomen, chest, or *encephalon*, whichever may be the part more particularly affected.

The prognosis is generally unfavourable. The disease approaching insidiously appears to rivet itself in the constitution; its removal will consequently be more difficult, relapses more frequent, and convalescence lingering. Much depends, however, upon the habits of the patient and the length of time the constitution has been affected. The symptoms which denote danger are general œdema, much anxiety, and palpitation of the heart; the respiration becoming more affected as the fatal termination approaches, being laboured and quick, and interrupted, with sighs and groans, the pulse becoming weak and irregular at the extremities, with palpitations at the heart. The head being affected with coma and delirium are very unfavourable. With respect to the natural functions, much nausea, obstinate costiveness, dry and black tongue, are symptoms of danger; and in those instances where there has been a relapse with ascites, danger is indicated by the various symptoms denoting great debility of these functions. In some instances the disease is complicated with remittent fever. The prognosis is favourable when the œdema has come on gradually, and is confined to the lower extremities, when the skin is moist and moderately warm, when the patient enjoys sleep, and the vital functions are unaffected.

Treatment.—Regarding the treatment of Beriberi, several of the writers on the subject consider it a disease of debility, and recommend stimulants, deobstruents, and antimonials; whilst others, allowing it to be an inflammatory complaint, recommend blood-letting and evacuants. Both methods, I conceive, are applicable, being varied according to the peculiar form of the disease. The latter, however, I think to be the most correct view of the disease, considering it to be one of the tribe of idiopathic dropsies, which, according to Drs Parry, Blackall, and other late writers, are caused originally by increased momentum and disorder of the sanguiferous system, having a general alliance with inflammation, whatever appearance they may afterwards present. In this instance, particularly, I consider the disease as originating in a state of plethora, with obstructed circulation, and infer that the exhibition of stimulants gives only temporary relief, the morbid secretions being only oppressed while their cause is unremoved; whilst the use of blood-letting and evacuants is superseded generally by symptoms of increased energy of the nervous and arterial systems,—consequences which would not probably have taken place if the preceding debility was real. I have often observed, that, though the pulse at the wrist was weak and irregular, whilst there were pulsations in the large arteries, bleeding increased the strength of pulsation in the small arteries, and rendered it more uniform generally. This treatment is peculiarly applicable to those cases where there is much difficulty of breathing and delirium, the patient robust, and when the œdematous swellings do not pit much on pressure, where there is rapid and full pulsation of the large arteries, and where the urine shows the existence of albumen. Here the rapidity of the progress of the disease calls for some decided measure; and whether the head or the chest may be the part most particularly affected, as other means are of secondary influence, bleeding is the palladium of the patient's safety, and is generally followed by a diminution of the severity of the leading symptoms. The breathing becomes less oppressed and laborious, the œdema and numbness gradually disappear, the headach, restlessness, and delirium, are diminished in violence.

Calomel and squill given twice or thrice daily, in doses of eight or ten grains of the former to two or three of the latter, are useful as deobstruents, in promoting the absorption of the fluid deposited in the cellular texture or membranes; and, should the mouth be affected, the danger of a fatal termination is diminished. Should there be irritability of stomach, the effervescing draught with doses of laudanum and camphor mixture are useful in this, as well as in giving temporary relief when the dyspnœa is violent. Saline drinks are useful in promoting perspiration. The extremities should also be rubbed with stimulating liniments, and rolled in flannel bandages.

In those instances where the patient has long suffered from this disease, accompanied with abdominal dropsy, where he may have been worn out by any other previous disease, or had relapses of this, the strength must be supported by cordials, wine, bark, and nourishing diet. The abdomen and extremities should be rubbed with warm flannel and stimulating liniments. Calomel and squill given, as before-mentioned, are useful; and, should the mouth be affected previous to the removal of the dropsical symptoms, doses of equal quantities of the tincture of squill and digitalis, from ten to fifteen drops of each twice or thrice daily, may be given. Should the disease be complicated with periodical fever, which it occasionally is, quinine should be given during the apyrexia.

In the third mentioned form, or that in which the numbness and œdema appear confined to the lower extremities, Treeak Farook is very useful, given in the form of a pill composed of equal parts of Treeak Farook, cloves, and rhubarb powder, three times daily. It does not appear to be an active medicine, and would have little power in the severe forms of this disease. It is not accompanied by any violent purging, increase of pulse, or determination to the surface; but after it has been used for from one to two weeks, it is generally attended with the removal of the œdema and numbness or paralysis, should it be present. It is also useful in the other forms of the disease when the patient is convalescent, and paralysis and œdema have not entirely disappeared.

I have not been able to ascertain the ingredients of this medicine. It is, I believe, made in some province bordering on Arabia; but the papers which surround the leaden case, in which it is contained, throw no light on the subject. I believe it was first recommended by Dr Herklotts of this establishment as a remedy in Beriberi. In several instances in which it has failed, nux-vomica has been successful, commencing with doses of two grains daily, and increasing gradually. Local abstractions of blood from the spine are also useful, and a blister applied over the loins has given relief in many obstinate cases.

Visianagram, July 30, 1833.

ART. IV.—*Case of Abscess of the Anterior Mediastinum, with Fracture of the Sternum.* By DUNCAN REID, Esq. Surgeon, Aberdeen.

GEORGE CARDNO, æt. 18, about the beginning of April last, was suddenly seized with sickness, rigors, and severe pain of the head, along with general soreness and muscular prostration. He likewise complained of some pain in the breast, and disturbance of the breathing, with slight cough, and a considerable deal of nervous tremor, and agitation and fluttering about the heart. He went to an apothecary, who told him he was in a fever, and gave him an emetic, and some other medicines. The pain and uneasy feelings in the breast, however, became worse, when he applied for admission into the Infirmary; but was told there was no bed vacant at that time. Being poor, he was then recommended to one of the public Dispensaries, and was seen by the medical attendant of the institution, who ordered him to be bled, and a blister to be applied over the sternum. About a week after this a swelling became evident on the middle of the chest, which quickly increased in size with a continuance of some degree of pain, and considerable interruption of the respiration; but I could get no satisfactory history of its further progress or treatment, unless that the strictest quiet and abstinence had been enjoined, upon the presumption, it would seem, of the disease being internal aneurism. The medical gentleman under whose care the case first came having fallen into bad health, on the 24th of April, Dr Moir was requested to see the patient, when, as he was otherwise engaged, I was sent to inquire into the particulars of the case.

Before proceeding to a narrative of the symptoms, I may mention that the lad had been employed as a blacksmith at Duffus and Co's chain-work, but had left this previous to his illness, and engaged as a labourer in one of the stone quarries near this place, where he was much exposed to cold and wet. On more minute inquiry I likewise found, that some weeks before the accession of the preceding symptoms, he had quarrelled and fought with one of his fellow workmen, and, while in a stooping position over him, received from his prostrate opponent a severe kick with a heavy ironed shoe on the chest. He complained, however, of no uneasiness from this blow at the time, nor did he ever afterwards allude to it as the cause of his illness.

When I called, the patient was lying on his back, almost unable to speak or move, the breathing being extremely quick and panting, the cheeks flushed, countenance anxious, and pulse small and rapid, with an immense swelling over the chest, having the following characters. It occupies the whole of the middle anterior region of the thorax from near the left nipple to the right axilla. There is a weak pulsatory, thrilling, or vibratory sensation, communicated to the hand, but no distinct or strong impulse. The tumour rises considerably above the level of the chest, giving its anterior aspect a rounded conical shape; it is soft, yielding, and evidently filled by a fluid. The most prominent part corresponds to the middle of the sternum, and the skin is here discoloured and red, as happens where an abscess points; but there is another portion of the swelling, nearer to the right axilla, and under the pectoral muscle of this side, which is less elevated than that already described, of an oblong flattened form, and evidently communicates with the cavity of the other, as the one part of the swelling rises, and is filled up by pressure on the other. The breathing is very hurried, short, and difficult, and the embarrassment is much increased by pressure on the tumour with the hand; he has frequent irritating cough, and tough mucous expectoration; there is peculiar anxiety of countenance, with great restlessness and vigilance; the pulse is about 100, compressible, weak, and having a peculiar oscillatory thrill, but no perceptible intermission or irregularity; the tongue is dry and brown on the centre, with thirst; the bowels slow; no appetite.

Such are the observations I was able to collect from the patient and his attendants; but feeling some uncertainty regarding the nature of the complaint, and not having a stethoscope with me to correct the obscurity of the general symptoms, I could not instantly determine what was proper to be done. When I saw Dr Moir I alluded to this, and particularly noticed the view apparently taken of the case by the previous medical attendant, but from my account he at once said, "It is much more like empyema than aneurism," and, to remove any doubt, advised a careful examination by mediate auscultation.

25th. When I visited him early this morning, I found that the swelling had burst some hours previously, and discharged an immense quantity of purulent matter, so much, indeed, that the patient was actually lying deluged in pus. The external tumour has completely disappeared, the ulcerated opening in the skin, by which the matter found exit, being situated on the left side of the sternum between the cartilages of the second and third true ribs; it is round, of a size that would admit the point of the finger, and appears to communicate directly with the cavity of the thorax. The whole breadth also of the sternum seems to be absorbed, or rather it appears as if fractured across, and the third rib on each side is dislocated from its sternal attachment, the free ends rubbing and moving past each other with some pain, and a grating sound during the respiratory acts, or when pressed with the hand. Air likewise rushes in and out through the ulcerated hole in the skin during the motions of the chest with a sonorous cooing sort of noise, more or less loud, according to the violence of the action of the respiratory muscles, and corresponding to the recurrence and succession of the respiratory efforts. The breathing is very quick and difficult, and cough frequent. He cannot lie on either side, sit upright, or, in fact, be moved from his back without exciting instant cough, great difficulty of breathing, pain, and distress. Every time he coughs, likewise, from the opening not being sufficiently depending to empty the abscess, a quantity of purulent matter gushes, or is forced out by the sudden contraction of the muscles. He expectorates a good deal of a frothy tenacious fluid. He is weak and faint, the pulse small and thready, 120; circumscribed flush on the cheek; the tongue brownish and dry, with thirst.

By applying the stethoscope directly over the opening, a loud noise strikes the ear, like air rushing through a narrow hole or passage, accompanied with a bubbling sound, as from the motion of a fluid, which is perceptible for some distance round the opening. There is nothing like pectoriloquism to be distinguished, but at a little more distance this loud humming sound is confounded with the gurgling noise; then this disappears for the mucous râle, which puts on several modifications, and simulates the chirping of birds, cooing of pigeons, snoring, &c.; and over parts of the chest still more distant, these give place to a loud sonorous, and in the upper and lateral thoracic regions, shrill puerile respiration. Percussion elicits a dull sound, particularly in the neighbourhood of the abscess. There is nothing unusual discovered in the action of the heart and great vessels.

To confine the motion of the ribs and separated pieces of the sternum, I put a broad bandage round the chest, as for fracture of the ribs, at the same time leaving the ulcerated opening free, and ordered small quantities of wine diluted to be given frequently, and the following mixture :—

℞. *Mistur. Camphor.* ℥iv.; *Aq. Acetat. Ammon.* ℥j.; *Tinct. Opii.* gtts. l.; *Syrup. Simplicis* ℥ss. *M. Ft. mistura, cujus capiat cochleare amplum quâque 2da hora.*

In the evening, breathing still very quick and difficult; great discharge from the opening in the chest, through which air continues to pass, with a hissing noise, at every inspiration and expiration; pulse rather firmer and fuller, about 108; face rather flushed; inclined to dose and sleep. He has taken about a glass and half of wine, which omit. Continue the mixture at longer intervals.

26th. Breathing continues hurried and labouring; pulse about 110; face flushed, and full; perspiring freely; tongue now white and moist; great discharge from the chest; frequent irritating cough; expectoration frothy, tenacious, and mucous; thirst; bowels not open for three days. He asked for some small beer, which was allowed, and felt inclined for some food, and has taken a little tea and bread. Let him also have ripe fruits, lemonade, &c.

℞. *Ol. Ricini,* ʒiv.; *Tinct. Rhæi,* ʒij.; *Aq. M. Piper,* ʒvj.; *M. Ft. Haustus statim sumendus.*

27th. The discharge from the chest is rather less in quantity, inodorous, healthy, purulent matter. The passage of air through the opening continues by the suction-kind of movement. The bubbling cavernous rhonchus is less distinct by the stethoscope. It now approaches more nearly to the mucous râle, which, with the crepitous and loud shrill respiration, extends over the greater part of the chest. The sound from percussion is also very dull. The breathing is hurried and difficult; and short frequent cough is very troublesome, with considerable quantity of expectoration. In the fore-part of the day he was pretty quiet, pulse about 108, and bowels opened moderately; but towards evening he became hot and restless, with rapid small pulse, and the hurry of breathing and frequency of cough very distressing. Cooling diluents, acidulated drinks, &c.—*Repetr. haust. Camphorae.*

28th. He was restless during the first part of the night, but towards morning slept a good deal. To-day he is more composed, and the pulse more full, 115, and of moderate strength. The respiration is still quick and hurried, and performed with considerable labour, and a wheezing noise. There is frequent tickling cough, and the expectoration continues of a mucous ropy consistence. The purulent discharge from the chest is diminished; and there are one or two points of ulceration in the skin on the right side of the sternum, situate over the cartilage of the fourth rib. Finding that these communicated with the cavity of the abscess, a director was introduced, and the skin divided for some extent, thus making a freer and more depending outlet for the matter. The pleura was seen at the bottom of the wound alternately rising and falling with the expansion and compression of the lungs. By pressure, a considerable quantity of matter was discharged at the opening now made, and this was accomplished more freely by turning the patient on his side and towards his face. The difficulty of breathing, however, violence of cough, pain, and uneasiness, brought on by this position, rendered it necessary quickly to replace him on his back. Several turns of a broad roller were applied round the chest, with compresses on the site of the abscess, so as to confine the action of the muscles from disturbing the ribs and sternum, and at the same time in such a way as to leave free exit to the matter. The bowels have been opened twice; stools dark and offensive; thirst less; tongue moist and cleaner; some appetite. Mild farinaceous food, beef-tea, &c.; and, with the concurrence of Dr Moir, the following mixture was prescribed:—

> ℞. *Mistur. Salinae*, ℥vij.; *Vin. Colchici*, iij.; *Tinct. Digitalis*, ʒj.; *Syrup. Simplicis*, ʒiv. *M. Ft. Mistura, cujus sumatur cochleare amplum 6ta quaque hora.*

29th. When seen in the morning he was pretty quiet; cough less frequent; breathing not so hurried, though still difficult; pulse about 112; considerable discharge from the openings in the chest. By stethoscope the respiratory murmur is dull, and over some part of the anterior of the chest almost inaudible, particularly on the right side. On the left side it is more distinct, but here also it is less loud than formerly, and mixed with the mucous and rustling sound from the effusion of fluid; and, as we recede more to the lateral and posterior regions of the thorax, the murmur becomes louder and more sonorous. The resonance of the chest on percussion is much impaired. In the evening I found that he had vomited, and that the bowels had been opened two or three times. The pulse was small and indistinct, slower, and somewhat irregular. The vomiting had caused a good deal of pain, and slight hemorrhage at the wound from the effort disturbing the separated portions of the sternum and ribs. The breathing seems still pretty quiet, cough less frequent, and expectoration less copious. The bandage was readjusted.—*Omittat. Mistura c. Vini Colchic. et repetat. Mist. Camphorae.*

30th. He has passed a restless and uneasy night; bowels moved once this morning; stool loose, very fetid, and dark; breathing very hurried; cough and expectoration less; discharge from the sores also much diminished; tongue moist, pretty clean; pulse small and weak, 96. He was desired to get a spoonful of wine and water now and then. In the afternoon there was no improvement. He was becoming still weaker, and the surface cold; the breathing was laborious and rustling, and the lungs becoming more infurcated with frequent short tickling cough; the pulse small, weak, and indistinct, about 90.—*Continuentur Mistura et Vinum.*

May 1st. He continued to become weaker; and, sinking rapidly towards morning, died about four o'clock.

Inspection of the body twenty-eight hours after death.—When viewed externally the sternum is seen to be depressed or fallen in, particularly the lower of the separated portions. An incision was made along its whole length, dividing the skin, which was then dissected with the muscular attachments from the ribs, and turned backwards. This exposed that part of the abscess external to the ribs, which extended from a little to the left side of the sternum, across the middle of the chest to the right axilla, and showed that here it was merely covered by the skin and part of the pectoral muscles, among the layers of which the matter had burrowed, and detached some of their origins from the ribs and sternum. It was now also observed that the two external openings, by which the matter was discharged, were situate on each side of the sternum,—the one, that first ulcerated on the left side, being immediately above the cartilage of the third rib, and close by the edge of the breast-bone; the other in the intercostal space between the third and fourth ribs of the right side, at some distance from the sternal connections. The cartilaginous extremities of the third true ribs were loose and projecting forwards, and were thus dislocated or separated from their sternal articulations on each side, and at this point also the body of the sternum itself was broken directly across. The ends of the pieces at the point of separation were rough, gritty, and angular or square, as if recently sawn asunder; and for some distance above and below this the anterior surface of the bone was completely denuded of its periosteum. The sternal articulations of the clavicles were now divided by the scalpel; also the cartilages of the true ribs, leaving them attached to the sternum, which, with the parts thus isolated, was raised and removed by cutting through, and bringing away along with them portions of the substance of the lungs and pleural reflections that were adherent behind. That part of the cavity of the abscess within the parietes of the thorax was now found to have occupied the whole of the space between the lungs and posterior surface of the sternum,—the matter being lodged in close contact with the bone, which is bare, and denuded of its usual coverings for a considerable extent. All the parts in the vicinity of the abscess were firmly united to the sides of the chest, and to one another, so that the carious ends of the fragments of the sternum floated, or were suspended in pus, and showed no appearance of any attempt at regeneration or deposition of new ossific matter. In removing the parts already noticed, the pericardium was opened, and found to contain several ounces of a serous fluid; the membrane was vascular and rose-coloured. The heart, though considered large for the size of the individual, and having its muscular structure strongly developed, appeared itself to be free from disease. The lungs on the left side adhered to the parietes of the chest anteriorly, but were free posteriorly; on the right side the adhesions were more extensive, as well as firmer, almost the whole of the right lobes being glued to the costal pleura, and to one another, by coagulable lymph in the form of false membrane, or short bands of adhesive matter. The anterior portion of the lungs behind the sternum, and where they formed part of the posterior wall of the abscess, was somewhat flattened and depressed. The pulmonary substance, though retaining its crepitous feeling in a considerable degree, was more solid than natural, and by dividing it, the tissue was found to be greatly gorged with blood, and of a dark-red mulberry colour. This was most observable in the inferior and middle lobes of the right lung,—the colour being deepest towards their roots, arising, no doubt, partly from position; more anteriorly, and in the upper lobes, the colour was brighter, of a rose hue, and light-grayish mottled appearance. Along with the dark-coloured blood escaping from the larger vessels, a great quantity of sanguineous serosity and frothy mucous fluid also flowed from the incisions. A single small concretion of calcareous substance was found in the superior lobe of the left lung. The abdominal viscera examined were quite healthy in appearance.

Remarks.—From the preceding account of the appearances on dissection, it will be seen that the abscess was properly before, or without the lining membrane of the chest, and must have at first been formed in the cellular tissue between the sternum and reflections of the pleura, in what is termed the anterior *mediastinum.* As soon as suppuration had commenced, the adhesive inflammation was likewise instituted, by means of which all the neighbouring parts within the thorax,—viz. the *pericardium* on the left side, and partly the *mediastinum* and substance of the lungs, which also, behind and on the right side, with the reflections of the *pleura* in a similar manner, formed the boundaries of the abscess, were agglutinated to the anterior parietes of the chest, and thus circumscribed and prevented its contents from passing into the cavity of the pleura. This effect was farther aided by the remarkable tendency of all abscesses to the surface of the body, so that the matter, after gradually collecting, had at length found its way through the intercostal spaces, dislocating the ribs, and forcing asunder the two portions of the sternum as described, until it was only retained by the pectoral aponeurosis and skin. There being now less restraint, it spread over the anterior surface of the sternum and chest on the right side as far as the axilla, separating and dissecting part of the muscles from their sternal and costal attachments, and continued to accumulate to an immense quantity before ulceration of the skin took place to allow of its escape.

The progress of the disease thus not only exhibits a good illustration of the curative powers of nature to a certain extent, but its event also affords an instance of their inadequacy when unassisted by means of art. Here, then, it may be asked, what was the proper practice to have been adopted in this case? If an early and direct outlet had been given to the matter as soon as suppuration took place, along with judicious subsequent treatment, there is a probability that the most dangerous symptoms might have been averted, and a cure, perhaps, accomplished,—as there are several instances on record, where fractures and other diseases of the sternum, followed by abscess of the cellular membrane behind the bone, have been treated successfully; but if the existence and nature of the complaint could not be discovered thus early, after the appearance of the external tumour, the propriety of its evacuation was surely no longer doubtful. How far there may have been any similarity to aneurism or difficulty of diagnosis in the early stage, I am not able to decide, as, by the time I saw it, the tumour was on the eve of bursting, which occurrence soon solved all difficulty. But the history of the case, its progress, and many other points of difference, assisted by the signs drawn from a careful stethoscopic examination, should have served to render its nature sufficiently obvious.

The next point worthy of consideration is the cause of the abscess. Did it originate from some constitutional peculiarity in the individual, or other circumstance, acting generally on the system—as variations of temperature, exposure to cold, fatigue, &c.; or rather is it not accounted for by the blow which he is reported to have received on the chest? If the latter be considered the true exciting cause, was the formation of matter the primary consequence, afterwards producing caries and absorption of the bone by its accumulation and pressure; or had there not rather originally been a fracture of the sternum, inattention to which had excited suppuration in its vicinity, detachment of the periosteum from the bone, caries, loosening, and at length complete dislocation of the costal articulations, and other consequences already detailed?

In this view it is rather remarkable that the patient never complained of pain, or showed any symptoms that might have led to a suspicion of fracture of the sternum, either at the time of receiving the injury, or afterwards. It is probable, however, that the fracture had been a mere fissure without displacement until suppuration happened, for otherwise the nature of the complaint could not have escaped discovery, even on a very cursory examination. If the separation of the pieces of the sternum had occurred at the point of union between the head, or *manubrium*, and body, which generally remains cartilaginous to the adult period of life, there might have been some room for supposing that the disjunction was brought about by softening and absorption of the cartilage; but the bone was broken transversely at least an inch below this, where the third true ribs are articulated without, and where the process of ossification is completed. The mere circumstance also of pus being in contact with a bone, is considered by the best informed authors as innocuous, and incapable, unless under peculiar circumstances, of producing caries or necrosis; and, although abscess had primarily taken place in the cellular membrane behind the sternum without any evident exciting cause, it is not likely that the matter would have forced its way through the bone in so direct a manner as to occasion a transverse separation of its body. It seems, therefore, just to conclude that injury, and most probably fracture of the bone, aided by the other causes of exposure to fatigue, hard labour, and perhaps constitutional predisposition, had given rise to inflammation and suppuration of the neighbouring textures and organs, which ultimately proved fatal.

Aberdeen, October 11, 1833.

ART. V.—*Case illustrative of the Spontaneous Evolution of the Fœtus, with Remarks.* By R. B. MALCOLM, M. D. Physician to the North-Western Dispensary, &c.

I RECEIVED a message from Mrs T., a midwife, about ten o'clock P. M. November 14, 1838, requesting my immediate attendance on a case of difficulty.

The midwife informed me that the patient was at the full period of utero-gestation; that it was her third pregnancy; and that she had been in labour since three o'clock A. M. of the same day. She was attended in the former part of her labour by an ignorant old woman, who, finding a part presenting the nature of which she could not ascertain, had, by forcibly pulling at it, endeavoured to deliver her patient. She at length succeeded so far as to bring down the arm and shoulder, when, not being able to effect the entire delivery, the assistance of Mrs T. was requested. Upon ascertaining the true nature of the case, she immediately sent for my father-in-law, Dr Thatcher. He was engaged at the time, and I was requested to attend.

The uterine contractions were of a very powerful description. Upon examination by the abdomen, the uterus was felt firmly contracted on the body of the infant. The patient complained vehemently of a violent rending pain in the region of the uterus, synchronous with each contraction of that organ. The arm, which was the left one, the shoulder, and a portion of the thorax itself, in a conical wedge-like form, was already expelled through the external opening. The shoulder was pressed forward under the arch of the pubis. The pelvis was completely filled with the remainder of the extremities and body of the fœtus. A large fold of the umbilical chord likewise presented, which was flaccid, and in which no pulsation was perceptible. The membranes had been ruptured a considerable time; the *liquor amnii* was completely discharged; the perinæum, and soft parts generally, were in a very favourable condition, relaxed, moist, and dilatable; the perinæal tumour was perfectly developed, being formed by the pressure of the thorax of the fœtus; the pelvis, as I had reason afterwards to judge, was well formed and capacious.

The uterine contractions were so powerful and frequent,—the resistance to the passage of the child so great,—and the cries of the patient so violent, as to render me apprehensive of rupture of the uterus, or, as a minor evil, of laceration of the perinæum.

I instantly administered a large and powerful opiate,—150 drops *Tinct. Opii*,—to suspend the uterine contractions, and thus allow an opportunity of introducing my hand if practicable, which, indeed, I much doubted, and of turning in the usual manner; or, at any rate, to allow time for the evisceration of the fœtus, if turning could not be accomplished.

The primary action of the laudanum was to a peculiar degree stimulant. The contractions were redoubled in strength and frequency. A large portion of the thorax was soon protruded. I now became certain that any attempt to introduce the hand, or to reduce the presenting part, could not be successful, owing to the powerful and almost incessant contractions of the uterus, and to the pelvis being so completely filled with the body of the child.

I became seriously apprehensive of rupture of the *uterus*, and had I possessed the necessary instruments, should, considering the death of the infant as certain, have eviscerated it, and thus have terminated the case with safety to the mother. As, however, no opportunity was afforded for obtaining these, I carefully guarded the perinæum with my left hand, and, with considerable difficulty, introduced two fore-fingers of the right into the *vagina*, for the purpose of ascertaining the exact position of the child. I had the good fortune to find both feet, near the *foramen externum*, jammed together between the lower part of the *sacrum* and the external opening, in contact with the *vagina*. From the position of the feet, I judged that the breech was resting at the top of the *sacrum*, or to one side of it, and the head consequently at the anterior part of the pelvis. I gradually brought the feet forward, and was at length enabled to accomplish the delivery. The feet, breech, body, remaining arm, and lastly the head, being adapted to the pelvis, as in an ordinary footling case, without the hand of the operator being introduced, or the presenting arm returned, into the *vagina*; in short, without turning having beeu had recourse to. The perinæum, although much stretched during the delivery, remained entire.

The fœtus, which was a female, appeared to have been dead a short time; the cuticle was perfectly sound; the left arm and half of the thorax were greatly swollen, and of a dark purple colour. The infant measured nineteen inches in length; the circumference of the head at its widest part, from forehead to occiput, was twelve inches; it weighed five pounds two ounces imperial weight.

From the above measurement and weight, it appears more probable that the infant was at the eighth month than at the full period of fœtal life, as supposed by the patient. It must, however, be admitted, that female children of no larger dimensions are occasionally produced at the completion of utero-gestation.

I may here state, that this patient made an excellent recovery without a single unpleasant symptom.

The profession have long been in possession of descriptions of a natural operation, occasionally, though rarely, occurring in presentations of the arm or shoulder, which has received the titles of "*spontaneous evolution*,"—"*spontaneous expulsion*,"—and *spontaneous version*;"[*] and of this process, various and very contradictory accounts have been given by different authors.[†]

Dr Burns, in his work on the Principles of Midwifery, states, that Schœnheider was the first who noticed this phenomenon, but that Denman first described it to British practitioners.

Dr Denman supposed, that, by the vigorous and long-continued action of the uterus, the feet or breech are forced into the pelvis, and that the presenting arm or shoulder gradually receded into the cavity of the uterus,—the case afterwards terminating as an ordinary breech or footling presentation. According to him, the ascent of the arm or shoulder was considered an *essential part* of the process, and took place *during the powerful contraction of the uterus.*

Dr Douglas of Dublin published a pamphlet on this subject, in which he impugns the accuracy of Dr Denman's description; denying the possibility of the presenting arm *ever* receding into the uterus when in a state of contraction, or, indeed, that it can ever, having once protruded, be replaced by the unaided efforts of the uterus. According to his theory, the breech or feet are forced, by the action of the uterus, into the pelvis, and finally expelled through the external opening,—the arm which originally presented continuing throughout the process in its former position outside the parts.[‡]

Dr Gooch, in a very scientific paper contained in the 6th volume of the Medical Transactions of London, supports the theory of Dr Douglas, and relates a case in confirmation of his view. He attended this case personally, and he has noticed every important particular with great accuracy.

Dr Gooch's case resembles in many points the one I have just narrated, with the following important exceptions: "The patient was at her full time. It was a first labour, and the child was large."—"The pelvis," also, "was not unusually spacious."

Dr Kelly of Newtown Swords, near Dublin, attempts to overturn the view taken by Drs Douglas and Gooch, and to support that of Dr Denman, in so far as the fact of the recession of the presenting arm is concerned. According to him, however, this occurs not during the *contraction*, but, on the contrary, during the *relaxation* of the uterus. The breech having been forcibly propelled into the pelvis during the contraction of the uterus, the arm recedes into the cavity of that organ, immediately upon its relaxation, by a kind of spring, caused by the elasticity of the body of the child.[*]

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[*] Denman, Gooch, and Murat.

[†] Denman, Gartshore, Martineau, Boer of Vienna, Herder of Weimar, Douglas, Kelly, Gooch, &c. &c.

[‡] An Explanation of the Process of the Spontaneous Evolution of the Fetus, with some Remarks, intended to induce an inquiry, whether the usual mode of Delivery be the more eligible in Arm Presentations. By John C. Douglas, M. D. &c. Dublin. Second edition, enlarged. 1819.

Dr Burns supports the opinion of Drs Douglas and Gooch, although he does not state that he ever witnessed a case of this description. Indeed, he says, that in Glasgow, where there are more than 202,426 inhabitants, he could not learn that more than two cases of spontaneous evolution had *ever* happened.[†]

Such are the contradictory views of eminent authors regarding this rare and interesting phenomenon. Many may imagine "that it signifies little whether, in the spontaneous evolution, the arm goes *up* or *down*; yet whenever nature surmounts an obstacle by means so preferable to those employed by art, the exact way in which she succeeds is an important object of inquiry."[‡] Perfectly agreeing in the correctness of this remark, I venture to bring the above case, with the annexed remarks, before the profession, being convinced that, "at this time it is impossible to say what influence a minute and accurate knowledge of this process, its causes, its mechanism, and the way to facilitate it, may have on our future practice in arm presentations."[§]

It appears to me that the only method of arriving at a correct knowledge of these desirable points of information, is by the faithful narration of every case immediately connected with the subject, by those practitioners who may happen to meet with such, so as in time to form an accumulation of facts bearing on the question;—the peculiar rarity of the occurrence itself rendering of importance the narration even of a solitary case.

It is highly probable that, had the case above related been left to the unaided efforts of nature, supposing rupture of the uterus not to have occurred, that spontaneous evolution, as described by Drs Douglas and Gooch, would have happened, in which case the feet would have protruded before the breech, and the case been completed as already described.

It is hardly necessary to caution my readers against trusting, in the present state of our information on the subject, to the spontaneous evolution of the fœtus, in preference to the ordinary and more active practice recommended in the arm presentations. "If the arm and shoulder protrude far, the pains are strong, and the thorax presses hard on the perinæum, it will be right to wait and watch for a little time; beyond this, whoever suffers a knowledge of this rare fact to discourage him from turning in arm presentations, would be guilty, I think, of criminal irresolution."*

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[*] Essay upon the Spontaneous Evolution of the Fœtus. By John Kelly, M. D. 1816.

[†] Principles of Midwifery. By John Burns, M. D. 8th edition.

[‡] Gooch, Med. Transactions, 6th volume, page 246.

[§] Ibid. page 247

71, *York Place, November* 14, 1833.

ART. VI.—*Observations on the Maceration in Water of different Textures of the Human Body.* By JOHN DAVY, M.D., F.R.S., Physician to the Forces, Corresponding Member of the Medico-Chirurgical Society of Edinburgh.

ALTHOUGH the process of maceration by means of water has been long in use amongst anatomists in making preparations of particular parts, especially of the more solid; and, though of late years many observations have been collected bearing on this operation, particularly by Bichat in his *Anatomie Generale*, in which distinguished work he lays great stress on its effects as a criterion, in making his peculiar distinctions of tissues,—yet I am not aware that any inquirer has yet engaged in the subject systematically,—has attempted to investigate it through the changes which it produces, or even to ascertain with any accuracy what changes are really produced. Nor is this neglect surprising, considering the circumstances attending the maceration of animal matter,—the difficulty of procuring subjects,—the conveniences required,—the time necessary,—the great attention required to observe the fleeting phenomena,—the disgusting nature of the experiment,—and the idea of danger of health attached to them.

Many months ago I engaged in the investigation to remove doubts, and to gain information which I could not obtain from authors. The results which I have obtained, though far from being so finished or so perfect as I could wish, I shall now have the honour of communicating, as a contribution to anatomy and animal chemistry. What I have above-mentioned in excuse for former neglect will, I trust, serve as an apology for present imperfections.

I shall, 1*st*, describe the circumstances under which the experiments were made; 2*dly*, I shall give a brief account of the subjects from whence the parts used were taken; 3*dly*, I shall relate generally the results obtained, or the observations made;

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* Gooch, Med. Trans. Vol. vi. p. 247.

and *lastly*, I shall consider the conclusions which may be deduced from them.

1. *The circumstances attending the experiments.*—The experiments were all made in Malta, in the same room as that which I noticed in giving an account of my experiments on putrefaction in a former paper, and during a period very nearly comprehending twelve months. The water used for the purpose of maceration was aqueduct water, that of the town of Valletta, which appears to be very much the same in quality throughout the year; and seems to be variable chiefly in temperature, from being conveyed a distance of about eight miles, and a considerable part of the way running very slightly protected from atmospheric influence. During the spring months, its temperature varied from about 55° of Fahr. scale to 65°; during the summer, from about 65° to 75°; during the autumnal, from about 75° to 65°; and during the winter, from about 65° to 55°. In the cool season, it was always a few degrees above the temperature of the room; and in the hot season, a few degrees below it. But as the water was changed every day, or every second day at farthest, and as a gallon or two was generally used for maceration, the alteration of temperature of the water during the progress of the experiments was immaterial and undeserving of particular attention. I have said that the quality of the water was apparently always much the same. This I have not proved by analysis; it is conjectured from considering that the aqueduct is fed by springs in limestone rock, which are perennial, and very little affected by the seasons. In July last, I particularly examined the water. Its temperature, then, as its flowed from the pipe into the room, was 73°; its specific gravity was 1.008; 100 measures of it contained 4 measures of air, and this air consisted of 10 carbonic acid gas; 62 azote; 28 oxygen.

Its saline and earthy contents were very inconsiderable, not quite $\frac{1}{3000}$ part,—and consisted chiefly of carbonate of lime, dissolved by carbonic acid, and of common salt, with a very little lime and magnesia and fixed alkali in combination with the sulphuric and muriatic acids.

The vessels in which the parts were subjected to maceration were glass jars, varying in capacity from one to two gallons. In some instances, they were covered slightly, to keep out dust; —in others, they were uncovered. The subjects of the experiments were generally suspended in the water by common pack-thread, and to prevent their floating when air was generated, they were kept under by a counterpoise of glass attached by the same kind of thread to their inferior surface.

2. A *brief account of the bodies from which the parts, the subjects of the experiments, were taken.*—It may be remarked generally, that all the bodies were of the male sex; and all of

them, with the exception of two, of soldiers, English, Scotch, and Irish, who died in our hospitals.

1. Aged 25, died unexpectedly on the 24th August 1828, labouring under symptoms of continued fever of five days' duration. The body was examined about five hours after death. Nothing satisfactory was discovered to account for the fatal event. Blood, in large quantity, had been abstracted twice, and active purges had been used.

2. Aged 29, died on the 10th October 1828. The body was examined twenty-two hours after. It was much emaciated; the cerebrum was in a very soft state, especially its central parts; the lungs abounded in minute tubercles; the superior lobe of right lung contained a tubercular excavation; and the lower part of the ileum was slightly ulcerated.

3. Aged 23, died on the 16th October 1828 of "continued fever" (as the disease was called) of nine days' duration, with some anomalous symptoms. The body was examined fourteen hours after. The cause of death was not ascertained in a satisfactory manner. Some lymph was found effused in the posterior mediastinum, and the lungs contiguous to the mediastinum were turgid with blood, and in a certain degree hepatized; the spleen was unusually large and soft; and the lower part of the ileum was slightly and obscurely diseased.

4. Aged 24, died on the 4th November, having had the thigh amputated on the 16th October 1828, and the femoral artery tied just below the *arteria profunda* on the 22d, on account of secondary hemorrhage. The body was examined twelve hours after death. The crural and iliac veins of the diseased limb were thickened by deposition of coagulable lymph. The lower half of the thigh bone, which had been amputated, was in a very diseased state, as were also the tendons and muscles attached, and the whole of the knee, almost every part of which was altered; whilst the leg and foot, with the exception of œdema, appeared to be in a sound condition.

5. Aged 56, died suddenly on the 11th November 1828. The body was examined fifteen hours after. The heart was unusually large; the semilunar valves of the aorta were partially ossified; the orifices of the coronary arteries were very much contracted; the *arteria innominata* and the arch of the aorta were enlarged; the aorta was generally diseased, its inner coat irregularly thickened, and its middle coat corresponding more or less absorbed.

6. Aged 18, died on the 12th November of dysentery. The body was examined twelve hours after. It was considerably emaciated; and the colon exhibited appearances usual to this disease in its severe chronic state.

7. Aged 23, died on the 29th November of acute dysentery. The body was examined three hours after. An abscess was found in the liver. The colon throughout was greatly diseased, as it usually is, in fatal cases of acute dysentery.

8. Aged 23, died on the 23d December of *phthisis pulmonalis*. The body was examined five hours after. The whole of the left lung, and the superior lobe of the right, abounded in small tubercles; and in the former were two or three vomicæ. There was a small ulcer in the duodenum. There were several ulcers in the jejunum, and numerous ones in the ileum and colon.

9. Aged 32, died on the 26th December. The body was examined twenty-two hours after. The liver contained two abscesses. The large intestines were severely ulcerated.

10. Aged 29, died on the 7th January of acute dysentery. The body was examined sixteen hours after. There were patches of coagulable lymph on the lower part of the ileum (its villous coat). The colon throughout exhibited the worst effects of acute dysentery.

11. Aged 20, died on the 7th August 1829 of acute dysentery. The body was examined six hours after. The colon was very extensively and severely ulcerated, &c.

12. Aged 26, died on the 8th August of dysentery. The body was examined nine hours after. The lower part of the ileon was slightly ulcerated. The colon was extensively ulcerated, &c.

Some of these fatal cases have been noticed in a former paper "on the temperature of the human body after death," &c. 1, 4, 7, 8, in this, correspond to 3, 6, 7, 9, in that.

The experiments on maceration were commenced immediately after the inspection of the bodies. The water, as already remarked, was changed every day, or every second day, and the changes produced were as frequently observed during the first four or six months, and were noted down from time to time.

3. *General results of the experiments on the maceration of the different parts of the body.*—Were I to give a minute account of the observations which I have made on the different parts of the body whilst undergoing maceration in water, a volume almost would be required to contain them,—the details would be extremely tedious, and their utility very doubtful. I shall endeavour to avoid equally the too extremes of great minuteness of description and of excessive brevity, and confine myself as much as possible to a narration of the more important results. I shall commence with those parts in which the changes produced by maceration are most rapid, and proceed to those in which they are least so, but not confining myself to this order when a

natural connection of the parts, or any other reason, renders a deviation from it useful.

Fibrinous concretion from the heart (6).—The water having been changed daily from the 4th of November to the 12th, the concretion had become quite white, rather soft, and of a slightly putrid odour. On the 22d, it was reduced to a kind of pulverulent sediment. The same change takes place in the common fibrin of the blood, whether separated from the colouring matter artificially or naturally, as in the buffy coat, and as in the instance above given of the fibrinous concretions formed in the heart. The time required for the alteration is variable, according to the degree of firmness of the fibrin, and according to the temperature, being directly as the one, and, as it were, inversely as the other; or, in other words, the firmer it is, so much the longer time is required; and the warmer the weather, or the water, so much the shorter time.

Muscle—Heart (4, 8).—Its muscular substance underwent rapid change; it very soon became putrid and soft, and was washed away in the form of pultaceous matter, very like that from the fibrin of the blood; whilst its enveloping membrane, its valves, tendinous chords, and the great vessels taking their rise from it, were but little altered. With care, at a particular period of the process of maceration, it was easy to show that the valves of the aorta and pulmonary artery are connected with the outer fibrinous sheath of these vessels; and I am disposed to believe that these valves consist of this tissue in greater proportion than of the inner coat, and that they owe their strength and peculiar properties rather to the former than to the latter. It is worthy of remark, that the thin muscular substance of the auricle underwent change less rapidly than that of the ventricles. Other muscular parts of the body were submitted to maceration; some of them, as the substance of the tongue, and most of the voluntary muscles, exhibited rapid change, like the ventricles of the heart; others, as the muscular coat of the *primæ viæ*, and especially of the rectum, and of the urinary bladder, more resembled the auricles of the heart in the slow manner in which they underwent alteration.

Brain (1).—This organ rapidly becomes soft in water, and forms with it a kind of emulsion, the consistence of which of course varies with the proportion of each. In the state of emulsion it has a peculiar and disagreeable odour, but neither fetid or ammoniacal. As the water cannot be changed, I do not consider it necessary to give here any particulars of the alterations which take place in the mixture left undisturbed for a considerable time.

Spleen (6, 7, 8, 10).—It became soft very rapidly, according to circumstances of temperature, &c. in a space of time varying from twenty-four hours to three or four days. When an incision was made into it, and gentle pressure applied under water, the softened matter (very like that from fibrin, coloured by the colouring matter of blood,) flowed out, fetid, and mixed with some air-bubbles; and, when it was softened throughout its mass, the operation of pressing it gently being continued under water, the whole of the softened matter was expressed, and nothing distinctly remained but the vascular structure of the spleen, contained in its enveloping membrane, and presenting a beautiful and instructive appearance,—the vessels anastomosing very freely, and in a certain regular manner, and retaining their strength very little impaired. Here, I may remark, that with the spleen thus prepared, I have often endeavoured to discover the cribriform structure, of late years attributed by some anatomists to the splenic veins. Nowhere could I observe this structure; every opening in the sides of the veins which I could detect was an opening into a branch. After the separation of the soft matter, when the maceration of the spleen was continued, it slowly underwent change, and wasted away; the more delicate structure disappearing first, and the trunks of the vessel, and the including membrane enduring longest, much in the same manner as the larger vessels generally, and the fibrous and serous membranes, which we shall consider hereafter.

Pancreas, (2, 3, 7).—This organ softened nearly as rapidly as the spleen. When gently pressed under water, the soft, fetid matter was separated; and after two or three days successively, renewing the pressure, nothing but its vascular structure and its duct remained, which latter was of great strength, and resisted further maceration for a long time.

Parotid Gland, (6, 9).—It softened much in the same manner as the pancreas, and the pultaceous matter derived from it was very similar. After the separation of this, there remained a tissue of strong cellular texture, vessels, nerves, and branches of duct, which, the maceration being continued, gradually softened, and were very slowly decomposed. The duct itself resisted decomposition very powerfully, and so did a portion of the lining membrane of the mouth, in which it terminated, and from which, in minute structure, it was not distinguishable.

Thyroid Gland, (8).—It underwent the same changes as the parotid, and in about the same time. When the pultaceous matter generated was expressed, there remained also a tissue of nerves, vessels, and cellular texture.

Prostate Gland, (12).—This organ changed rapidly, and was soon reduced to a soft pultaceous mass of a fawn colour, in which a vestige only of cellular tissue could be detected, and the remains of some small vessels.

Kidney, (4).—It gave off a good deal of the colouring matter of the blood, and was soon reduced to a soft mass; after gentle pressure under water, there remained only the *infundibula*, which had a delicate vascular structure,—a few large vessels; its enveloping coat, and the lining membrane of the pelvis, which did not resist prolonged maceration for so long a period as the vessels and membranes of spleen.

Liver, (3, 4, 8, 9).—It underwent change pretty rapidly, and in a manner not unlike the kidney. The water was first discoloured by blood, next by grey pultaceous matter derived from softening of the substance of the viscus. After maceration for a month or six weeks, there remained little besides its vessels and the branches of its duct. These resisted decomposition much longer, especially the larger vessels and the hepatic duct, and some of its branches, to which adhered, for a considerable time, very minute grayish or brownish granules.

Lungs, (3, 4).—The substance of the lungs softened pretty rapidly, and was easily broken up; a portion of it, well washed, displayed very prettily the vascular structure of the organ; after about a month or five weeks, little remained but the larger vessels, (some of which retained their minute ramifications,) and the pleura comparatively little altered. Where there were tubercles, the alteration of softening was quickest, and it commenced with the tubercles. It was very difficult to distinguish, during the progress of change, between the bronchia and the blood-vessels, and decide which underwent change most rapidly.

Arteries.—Aorta, (4, 5, 10).—*Pulmonary Artery*, (10).—*Cœliac Artery*, (8).—*Femoral Artery*, (4).—These vessels have undergone change very slowly. The different coats have gradually softened,—the inner and outer coat first. The inner coat has become, as it were, mucilaginous, and has been washed off, or removed by the gentlest friction. The outer coat has resisted longer; it has finally become disintegrated and reduced partly to a kind of mucilage-like matter, and partly to its component fibres, not distinguishable excepting on very minute examination of the debris. The middle coat has become soft later than the preceding; has wasted irregularly; has become full of holes, and has gradually fallen to pieces. During the change, the outer coat assumed a brownish hue,—the hue of the inner coat was little altered; the middle coat acquired a bright pink colour. The different arteries exhibited some varieties of change; the pulmonary artery underwent it slowest; the aorta of No. 5, which was diseased, also underwent change very slowly, and in a peculiar manner. The inner coat separated from the middle, and the middle, in places from the adjoining fibrous coat, and the middle coat, where thickest, separated into laminæ. These alterations took place in a space of time varying from six weeks to eight months. It may not be amiss to remark, that by fibrous coat of artery, I mean that which is next to the middle, and between it and the loose cellular texture, the envelope of the vessel, in which there is generally some fatty matter, and which appears to be even less liable to change than the fibrous, but subject to the same kind of alteration.

Veins.—Vena cava, (4, 5.)—It gradually softened; the outer cellular or fibrous coat preceding a little in its change the proper coat or coats of the vein. The softening and wasting process went on irregularly; one portion suffering greatly, and another adjoining very little; and the kind of change was not always the same in the same texture; here a spot became soft, semi-transparent, and depressed; there elevated and mucilaginous. In some places it was discoloured brown, in others greenish. Gradually it became extremely thin and worn into holes,—and the change continuing, it was reduced to shreds and particles.

Thoracic duct, (8.)—It slowly underwent change like the *vena cava.*

Nerves.—I have made but few observations on this subject, and these have been confined to the crural nerve, (4.) Its theca gradually softened; in about two months the enveloping and connecting tissue constituting the theca was partially reduced to a brownish mucilaginous state, which was detached on the slightest friction, and then the nerve separated into its component filaments. These filaments slowly lost their strength, became, as it were, mucilaginous, and fell to pieces.

Pia Mater and Arachnoid Membrane, (11).—The latter membrane, in this instance, was slightly opaque, and consequently the better fitted for observation. In their change from maceration, the two membranes kept equal pace; they slowly lost their strength, in some places more so than in others; holes formed in them, which, gradually increasing in number and size, in about two months reduced them to shreds. The small vessels ramifying through the *pia mater,* wasted and disappeared much before the larger ones; these latter remained to the last, but perforated, and undergoing the same kind of change as the membranes themselves.

Theca Spinalis, (8).—It underwent change slowly. In about six weeks it presented a very varied appearance; in some places eroded, as it were, and became very thin; in others holes formed; close to them there was a conversion into transparent spots; and generally, there was a fibrous vegetable growth adhering to the surface, from which it had sprung. The same kind of change gradually proceeding, the membrane was reduced to shreds, and these ultimately to particles of a fawn colour, easily suspended in water.

Dura Mater, (2, 3, 4, 10.)—This membrane, during the first two or three weeks, did not appear to undergo any change. Gradually its surface became slimy, either with or without discoloration, but more frequently the latter. In different specimens the discoloration was very various, as bright-blue, brown, orange, red, and greenish. A wasting of the substance of the *dura mater* attended the formation of the slime, or soft mucilage-like matter; and, being washed off as it successively formed, the membrane became very thin and corroded into holes. The change proceeded very irregularly. The wasting was chiefly confined to particular spots, as to so many centres of action; the adjoining portions remaining little altered for a long time, and having their strength but little impaired. In these portions, thus exempted in a manner from rapid alteration, the structure of the tissue was well displayed; the very delicate connecting fibres yielding to decay first, the coarser fibres became so much the more apparent. Sometimes the membrane divided into two layers,—occasionally into three or more laminæ; but it was always easy in this stage to effect its separation into two. Progressively, every part partook of the change, and the membrane was reduced to shreds and particles. Some of these shreds I have examined after having been in maceration eleven months. Internally, when drawn asunder, they displayed the original colour and lustre and texture of the *dura mater*, and they themselves appeared to be in progress to ultimate decomposition. It was curious to observe the different specimens placed under similar circumstances undergoing change. Hardly in any two was the change exactly similar, varying either in the rapidity with which it took place, or in the discoloration attending it; and this without any apparent cause, as if owing to difference of composition not appreciable by the eye. During the early progress of the experiments, I often sought to discover, on the inner surface of the *dura mater*, the arachnoid membrane; but I was never able to succeed in detecting it. And I may here remark, that all the other attempts which I have made to demonstrate it have been failures; and in consequence, I am disposed to believe that it is not reflected over the *dura mater*, according to the ingenious idea of Bichat. In anatomy, I trust, the same severe logic will be approved of as in chemistry. The senses, the eye, and touch, must direct the judgment. What is conjectural must be called conjecture, and not advanced as fact, otherwise there will be no end to illusion and error.

Pericardium (3, 9).—It underwent change like the *dura* *mater*, rather more slowly in the early part of the process, and more rapidly in the latter, and without discoloration. Maceration, I may remark, afforded no evidence of its being a compound texture, consisting of an outer fibrous, and inner serous membrane, of different characters, as Bichat considered it. That it is a fibrous or fibro-cellular structure, capable of secreting serum, is certain; but more than this at present appears hypothetical, and deficient in anatomical demonstration.

Skin—Cuticle (4, 10).—The cuticle became detached from the *cutis* in from ten to thirteen days, and from some parts sooner than from others. It very slowly underwent change. It became discoloured, generally brownish; in one instance partially blue. A slimy matter formed on it, attended with softening; and it gradually fell to powder or small shreds. These changes were best observed in the thick cuticle of the sole of the foot, in which instance they occurred in about twelve months.

Cutis (4, 7, 9, 10).—The *cutis* of different parts underwent change somewhat differently. The difference was most remarkable in the very thin *cutis* and the thick, as in the cutis of eyelids, prepuce, and scrotum, and in that round the anus, on the chin, abdomen, &c. The very thin *cutis* resisted change for a long time, the subjacent cellular tissue became distended with water, and then it was extremely difficult to say where this tissue terminated, where the *cutis* commenced; in fact, the former passed into the latter, and the latter seemed to be merely the boundary surface of the former, the fibres only more closely compacted than in the loose tissue, and, in the instance of the *scrotum* and *cutis* of penis, impregnated with brown colouring matter. Maceration being continued, gradually the surface became covered with slimy matter, a softening took place, the cutis became thin in spots, and holes formed; and at the same time the subcutaneous tissue lost its strength, became slimy, its fibres separated, and ultimately both cutis and subjacent tissue were reduced to a sediment of shreds and particles. The thick cutis underwent change more rapidly at first, and slower afterwards. In a short time, as in about a fortnight or three weeks, it became discoloured of a bright pink or yellow hue, and it exhibited a cribriform structure, very many small holes having formed in it, arranged in a pretty regular manner, penetrating through the *cutis*. What remained constituting this cribriform texture was decidedly fibrous. The fibres were more or less coarse and interwoven, and had the colour, lustre, and general appearance of the fibres of tendons, or of the *dura mater*, when separated by maceration. This rapid change was most distinct in the *cutis* of the verge of the anus. It may be remarked generally, that the more the integuments abounded in the channels of hair and in fatty follicles, so much the more rapid was this first change or conversion into a cribriform structure. After it had formed, farther change was very slow, and in a manner very analogous to that of the thin skin, as of the *dura mater* and *pericardium*, and required even longer time for its completion. I have now in maceration, portions of *cutis* of the sole of the foot, of the ear, and of the verge of the anus, which have been subjected to the process during a year, and their fibrous structure is not yet entirely destroyed. Between the two extremes of very thick and very thin *cutis*, there are parts intermediate in degree of thickness, and intermediate also in relation to the follicles, &c. which they contain, as the skin of the inside of fore-arm, that covering the shin-bone, that of the ear not including its lobe, &c. and these parts observe also a kind of medium in their rapidity and manner of change. When examined in a certain stage of the process, they appear to consist of the same kind of tissue as the subcutaneous, only a little more condensed; and, to the thickest skin, the same remark relative to texture is, I believe, justly applicable.

Alimentary Canal, Mouth, and Fauces, (7, 9, 10).—Different parts of the lining membrane of the mouth and *fauces* underwent change with very different degrees of rapidity. Where the ducts of numerous mucous glands pass through the membrane, and where the membrane is not extremely thin, as in the roof of mouth, it soon acquired a cribriform texture, like that noticed under the head of the *cutis*; and thus perforated, it underwent farther change slowly. Where comparatively few mucous glands are situated in the subjacent tissue, and where the membrane is comparatively thick, as in the side of the mouth, and especially in the neighbourhood of the entrance of the parotid duct, there from beginning to end it suffered change very slowly. Over the tonsils it experienced the first, in cribriform change very rapidly. The glands constituting the tonsils were soon converted into a semifluid fetid matter, which was removed by washing, and there only remained a tissue of strong white fibres. Where the membrane was very thin, and at the same time penetrated by numerous ducts of mucous glands, as under the tongue, and especially on each side of its *frænum* and in the back part of the *fauces*, then it underwent change rapidly, and it was soon reduced to a mucilage-like and shreddy state. The change which slowly took place in the lining membrane of these parts, bore a very close resemblance to that experienced by the *cutis*,—a slimy or mucilage-like matter formed,—the part became irregularly corroded and worn into holes,—it lost its strength, and the whole was gradually reduced to shreds, and these ultimately to particles, which, indeed, throughout the change were constantly forming, and as they formed, were removed in changing the water. And I may remark, that the tissue subjacent to the lining membrane experienced the same kind of alteration; and the same kind of observation which induced me to consider the cutis as the external surface of the tissue connected with it, leads me also to infer that this membrane is an analogous boundary of the texture beneath it.

Tongue (7, 8).—I have not alluded above to the epithelium of the lining membrane of the mouth; it appears to be very similar to that covering the upper surface of the tongue. Like that of the tongue, it varies in thickness and distinctness in different parts. It is very thick on the roof of the mouth, and on the anterior and superior part of the tongue; less thick on the sides of mouth or middle part of the superior face of the tongue; hardly distinguishable on the surface of the fauces and the back of the tongue, and not distinguishable on the floor of the mouth under the tongue, and on the inferior surface of this organ. About the third or fourth day, this epithelium began to come away, or was easily detached; but from no part as a continuous membrane,—rather like a curd-like substance, especially from the roof of the mouth. From the tongue, particularly the apex, it might be detached in small portions, having some resemblance to cuticle, and bearing the impression of the surface to which it had adhered. After the separation of its epithelium, the next remarkable change in the tongue from maceration occurred in its muscular substance, which soon became soft and fetid; and in this pultaceous state it was soon washed away in changing the water, especially when gentle pressure was at the same time made to it. After the removal of this part there remained its case, as it were, which varied in texture in different parts. On the under surface it was a delicate membrane, apparently composed of cellular tissue, and which soon wasted away. On the upper it had a mixed character, as if composed of tendon-like fibres and of cellular tissue, the former prevailing most at and towards the apex, and the latter most towards the base and round the *foramen cæcum;* and in the anterior part surmounted by papillæ, which, minutely examined themselves, appeared to be bundles of fibres. These papillæ, and this fibrous and cellular tissue, slowly underwent a change very like that described when treating of the *dura mater*, skin, &c.

Œsophagus (7, 9).—In the inferior part of the œsophagus, and especially just at its termination, an outer membrane or epithelium, somewhat similar to that of the mouth, was (as it generally is) distinct; and it separated in the same manner. Higher up it became very indistinct; and I was not able to trace it in a satisfactory manner in the upper portion and through the pharynx, where, as I have already observed, its appearance is obscure, and its existence often doubtful. During continued maceration, the muscular coat of the œsophagus first disappeared. The inner or mucous coat gradually became soft and corroded. In about two months in winter its upper part was reduced to shreds, which, stretched under water, had the silky lustre and general appearance of cellular tissue, or of very delicate fibrous structure. The lower part was stronger, and resisted disintegration a little longer. The submucous tissue also resisted it a little longer; ultimately it was reduced to the same kind of debris, composed of fibres and altered particles, discoloured brown.

Stomach (4).—During the first eight or nine days there was no distinct softening or change of any part of this viscus. About the twelfth day the mucous membrane was softening in some places, and was easily abraded from the subjacent cellular layer. This layer, where the mucous coat was removed from it, had the appearance of peritonæal membrane. Its tissue was considerably distended with water. The muscular and peritonæal coats were of a light pink hue. About the eighteenth day the mucous coat was soft and slimy, and, when gently rubbed, was readily detached. About the thirty-fifth day the mucous coat was slimy, and of the weakest consistence; in many places eroded. The adjoining cellular coat, of a fibrous reticulated appearance, white, and of a silky lustre, had lost much of its strength, and was softening. The muscular coat was not every where distinct; where distinct, there cellular tissue appeared intermixed with it, and it was reddish and extremely feeble. The peritonæal coat, externally light-brown, internally white and silky, was also softening. On the forty-fifth day the change was in progress in all the tissues; and on the seventy-second the disintegration was nearly complete; and it was difficult to recognize any of the coats or layers, excepting the submucous, which, though almost deprived of coherence, yet was still pretty distinct; and the larger vessels passing through it were also distinct, but in the same soft weak state.

Small Intestines (3, 10).—These parts underwent changes very similar to those of the stomach, but rather more slowly. On the thirty-sixth day, in one instance, the surface of the mucous coat of the jejunum exfoliated in soft brown pellicles, and left exposed a fresh surface, in which vessels and fibres might be seen, presenting a very delicate appearance, derived from the submucous tissue, and terminating seemingly in the mucous or inner coat, in the form of loops, especially in the *valvulæ conniventes*, where this configuration was most distinctly displayed, and forcibly gave the idea, that the mucous coat is chiefly formed of vessels, ramifying from and into the submucous cellular tissue.

Large Intestines (3, 8.)—The changes which they experienced were also of the same kind, but were even slower in taking place. The submucous cellular tissue, especially of the rectum, where it is very thick, retained its form and considerable strength, after two months' maceration. The mucous membrane within the verge of the anus, like the skin at their line of junction, changed more rapidly than the contiguous part of either texture; and in about twenty-one days, in the cool season, when the cuticle was in the act of separation, even then the softening process had commenced. Minute cavities formed both in the mucous coat and in the *cutis*, which, increasing in number and extent, in about a month nearly effected a separation of the two membranes. This greater tendency to decompose in this place of junction, I am disposed to attribute to the mucous membrane, near its termination, having beneath it an unusual number of mucous glandules or follicles; and to the cutaneous membrane in the same situation having a large supply in its substance of reddish granules, which perhaps are follicles or glandules which secrete a fluid peculiar to the part. It may be remarked, that I could not follow the cuticle beyond the inner verge of the anus,—that, when it terminated, it seemed, as it were, to overlap, and to have no junction with any epithelium, similar to that which in the mouth connects the inner surface of that cavity with the outer surface of the lips.

Gall-Bladder and Biliary Ducts (2, 4).—Both the gall-bladder and the biliary ducts were slow in suffering change from maceration, especially the latter. After twelve days, in the instance of No. 4, they had undergone no apparent alteration. After eighteen days, when a portion of liver and pancreas attached to them were in a state of disintegration, the ducts did not appear to be at all changed; but the inner coat of the gall-bladder was softening, and, when gently rubbed under water, yellow particles were detached from it. After twenty-three days the inner coat of the gall-bladder was slimy, and coming off in flocculi, whilst the ducts were not materially altered; their peculiar structure remained distinct,—the lancet-shaped valvular processes at and near the mouth of the common ducts, and the transverse and oblique fibres and chords, which some anatomists have called spiral laminæ, in the cystic duct, were as distinct as at first, and not perceptibly weakened. The appearance of the inner surface of these channels bore a strong resemblance to the sinuses of the *dura mater*; and their general properties, and the manner in which they long resisted decomposition, and the manner in which they very gradually yielded to it, confirmed the analogy. After thirty-five days, neither the hepatic, nor the cystic, nor the common duct, nor a portion of the pancreatic duct attached, was altered, excepting very slightly; the lancet-shaped processes above alluded to were gradually wearing away. The cellular or cellular-fibrous tissue enveloping the gall-bladder and duct had become very soft; yet, when stretched under water, its fibres had the peculiar tendinous lustre and appearance. The inner reticulated surface of the gall-bladder still retained its orange hue; in many places it was of mucous consistence, or reduced to a slime-like state. After fifty-four days the ducts exactly resembled *dura mater;* the lancet-shaped processes were still distinguishable; the gall-bladder had lost almost entirely its inner reticulated surface,—that commonly called its mucous coat; and there remained little but a tissue of fibres, which, when stretched under water, had a silky lustre like tendinous fibres, and retained a greenish-yellow tinge of bile. After about three months there was little further alteration, and even after four no very considerable one; the ducts gradually wasted like *dura mater;* a mucous-like substance formed on them; they became eroded, as it were, and more in some places than in others, and worn into holes: and the investing tissue of ducts and gall-bladder became soft and incapable of resistance; and thus gradually, in from about six to eight months, they experienced a total disintegration, and were reduced to shreds and particles of a greenish hue.

Air-passages (7, 9).—Different parts of the *aspera arteria* suffered change very variously in relation to time. In the instance of No. 7, on the twenty-first day, there was an appearance of erosion of the epiglottis, and a wasting of the lining membrane of the trachea, portions of which were in a shreddy state; whilst the whole of the lining membrane of the larynx appeared to be unaltered, excepting the *sacculi laryngis*, the loose tissue in which had become distended with water, producing an appearance like œdema; and the same was observable round the *rima glottidis.* In the instance of No. 9, on the twenty-eighth day, the erosion of the epiglottis was very similar, but the alteration in the trachea less. On the thirty-second day, (in this latter example to which I shall now confine myself,) the lining membrane of the epiglottis was perforated with small holes, corresponding to glandules underneath, undergoing decomposition, situated in the substance of the cartilage, and in the connecting tissue, performing the part of its perichondrium; and similar minute perforations were formed in the lining membrane of the trachea, most remarkably in the back or membranous part of the canal, and I believe from the same cause, namely, softening and disintegration of the mucus glandules situated in the tissue next to the lining membrane, and communicating by ducts or pores with this membrane. At this time, the muscles of the windpipe and the thyroid gland were in a pultaceous state; but the inner membrane of the larynx still remained apparently unaltered. On the fifty-ninth day, the membrane of the epiglottis had almost entirely disappeared; its cartilage was full of perforations, and its margin was much worn and became soft. The lining membrane of the larynx was here and there slightly eroded, as if ulcerated. When a portion of it was dissected off and stretched under water, it had the appearance of a fibrous membrane. The *chordæ vocales* retained their original appearance; and their strength was not apparently decreased. The inner membrane of the trachea had nearly disappeared; the shreds of it which remained had also the character of fibrous membrane when stretched under water, although extremely delicate. The back portion of the lining membrane had most distinctly this character, and it had now acquired a cribriform feature, from the very many cavities formed in it. Of the changes which successively took place after the fifty-ninth day I have not any notes. I may remark, generally, from recollection of observations made on other specimens, that the *chordæ vocales*, the lining membrane of the larynx, the tendon by which the epiglottis is attached to the *chordæ vocales* at their junction, were the last parts which underwent decomposition; and that they underwent the change in a manner analogous to the *dura mater* and the tendons of muscles. The cartilage which yielded first was the epiglottis; next, the arytenoid and the cartilaginous rings of the trachea; and, lastly, the annular and scutiform cartilages; and they underwent the change principally by a process of softening, becoming slowly converted into a mucus-like substance. I may mention, that I endeavoured to trace an epithelium from the tongue into the larynx, but in vain: Also, that I sought for a villous coat in the air-passages, but in vain. The lining membrane appeared to me to be of the nature of a fibrous tissue throughout, and, strictly, not a distinct membrane,—merely the boundary surface of the lining tissue and component parts. I could detach no membrane from the *chordae vocales*; their surface appeared to be the same as their substance,—closely and very firmly connected tendinous fibres. Nor could I detach a portion in the form or semblance of a membrane from any part, excepting corresponding to a comparatively loose fibrous tissue, in which, or beneath which, were situated the glands, which gave the surface the character of a mucous membrane.

The passages of Nose and Ear, and the cavities connected with them (10).—I have not paid minute attention to these parts, during a long period of maceration. The few observations which I have made in one instance I shall communicate. Where the lining membrane of the nares joins the cutis, and where the cuticle of skin terminates, there, on maceration, during fifteen days, I have noticed a kind of epithelium, at that time of curd-like consistence, not dissimilar to the covering of the roof of the mouth, admitting of being scraped off, rather than detached as a continuous surface. As it has proceeded inwards it has rapidly diminished, and I have not been able to follow it more than half an inch in a satisfactory manner. The lining membrane of the nasal passages and cavities has resisted decomposition for a considerable time, and in some measure according to its degree of thickness.' The same remark is applicable to the lining membrane of the passages of the ear. The membrane of the Eustachian tube, being comparatively thick, has borne maceration a very long time; whilst the extremely delicate membrane of the tympanum has disappeared rapidly. Both the lining membrane of the nasal passages and of the ear have exhibited, generally, during maceration, the character of a fibrous tissue, with mucous glandules enveloped in them, or subjacent to them. In the former, I have been much at a loss to distinguish between the periosteum of the cavities and the lining membrane of the cavities; and in the frontal and maxillary sinuses, and those of the sphenoidal bone, I am much disposed to believe that they are one and the same membrane, with mucous follicles intermixed between their fibres. The membrane lining the tympanum, of such extreme delicacy and vascular, bears a greater resemblance to the *pia mater* than to either a mucous membrane or ordinary periosteum,—yet it seems to perform the function of both, though I am not certain that it is provided with any mucous glandules, or moistened with mucus. The *membrana tympani* appears to be continuous or connected with it; and also continuous or connected with the cuticular lining of the external passage, which is covered with cuticle, and which to the bony ring of the *meatus auditorius* seems to serve for periosteum.

The Eye.—The observations which I have made on this organ and its appendices, during maceration, have also been confined to one instance, (No. 10) and have been more hasty than I could have wished. During maceration, when the cuticle has separated from the eyelids at the inner boundary of the cilia, I have not been able to detect any, the slightest epithelium on the conjunctiva. The conjunctiva has undergone change like cellular tissue; the sclerotic coat like *dura mater*, but more slowly; the cornea has become of a milky appearance, has gradually softened, and has wasted away more rapidly than the sclerotica.

The lens has become soft, and like thick mucus; and the change has gradually proceeded from the circumference to the centre; and the central part, previous to softening, has assumed an opalescent and greenish hue. The membrane of the vitreous humour before softening, like the cornea, has acquired a slight degree of opacity, in consequence of which it has appeared so much the more distinct; it has resisted decomposition many weeks. The lacrhymal gland has undergone decomposition very like the parotid; and the lacrhymal ducts and sac, very like the lining of the nares.

The Urinary and Seminal Organs.—The bladder (4, 7, 6) in instance No. 4, was under observation seventy-two days. Marks of change began to appear on the sixth day, chiefly in the muscular coat. On the twelfth day this coat was of a light pink hue, whilst the inner coat was white, firm, and apparently unaltered. On the eighteenth day, the inner partially began to soften. On the twenty-third day, all the different coats were softening; the peritoneal was white, the muscular pink, and the inner coat yellowish, with slimy matter of the same hue adhering to it. On the thirty-fifth day, they had all become very soft, and capable of resisting little force; and both the peritoneal surface and the inner surface were slimy. On the forty-fifth day, the muscular coat was reduced to pale, soft shreds; portions only of the inner coat were distinct; and these, when examined under water, had the lustre and appearance of the debris of a serous or fine fibrous membrane. The adjoining cellular layer, and the cellular layer connecting the peritoneal coat and the muscular, and the peritoneal coat itself, were much in the same state. On the seventy-second day, very little remained; the small residue not lost in daily changing the water was in the form of a debris, resembling that of cellular, serous, or fibrous membrane; and I allude to the three, not knowing well how to distinguish the debris of the one from the other. The ureters, it may be remarked, resisted disintegration considerably longer. During the whole period of change, they very much resembled the biliary ducts, and gradually wasted like fibrous tissue. Whilst the maceration was in progress, I sought in vain for a membrane deserving the name of epithelium in the bladder and ureters; and I was as unsuccessful in my search for *villi* on their lining membrane. I sought also for mucous glands, or follicles, but could not detect them in a satisfactory manner in the bladder, excepting a few close to its orifice, in the small triangular space. In some instances, they appeared indistinctly in the ureters; in others not. I must confess, I have doubts if the lining membrane of the bladder deserves the name of a mucous membrane. In the dead body I have never found mucus adhering to it; and it is easy to conceive that the mucus which is contained in the urine may be derived from the glandules or follicles above alluded to, and from those of the urethra. I confess these doubts with hesitation; and chiefly because it appears wrong to take for granted that which is not proved; and no less wrong to place much confidence in analogical reasoning in opposition to, or not supported by, the simple evidence of the senses.

Testes and their membranes (7, 12)—In the instance of No. 7, after eighteen days' maceration, one testis suspended in water, deprived of its *tunica albuginea*, had become very soft and weak; its structure was well displayed, and its capillary tubes might be drawn out to some length. It appeared to be yielding pretty rapidly to decomposition,—but, to my surprise, it continued nearly in the same state more than a month. On the 60th day, little of it remained, and that was extremely soft. The *tunica albuginea* detached from one *testis*, underwent change rather more slowly than the other not detached. Both became corroded, gradually perforated, covered with a mucus-like substance and a fibrous vegetable growth. They underwent change more rapidly than the *tunica vaginalis*. On the 89th day, they were full of holes, and what remained was too weak to support its own weight; it was almost of mucilaginous consistence, and had acquired a certain degree of transparency. At the same time, the *tunica vaginalis* and the tissue of scrotum, though somewhat wasted, still retained a certain degree of strength, and when stretched under water, had very much their original appearance, —the appearance of a tissue of very delicate fibres, with some coarser ones intermixed, of a silky or tendinous lustre. During maceration, I attempted to divide the *tunica albuginea* into two or more layers, but could not succeed. The *vas deferens* underwent change very like the *tunica albuginea*; its inner surface, near its termination, which is a reticulated structure, composed of fine tendon-like fibres, resisted disintegration longest. The *vesiculæ seminales*, too, underwent a very similar change, and their inner fibrous reticulated tissue also resisted change the longest.

The Penis (6, 7.)—On immersion, this organ became distended with water, especially the loose prepuce and the cells of the *corpora cavernosa* and *spongiosa*. At the temperature of about 60°; after maceration of eight days, the cuticle almost ceased to adhere, and might be detached most easily. I carefully traced it to the mouth of the urethra; about a line inside of the orifice it terminated, much in the same manner as the cuticle terminates in the anus, overlapping the membrane of the urethra. I have endeavoured to find an epithelium as a distinct membrane in the urethra continuous with the cuticle; but in vain; nor have I succeeded in finding any *villi* in this canal. Few parts of the body resist maceration longer than the penis; and all its different textures are in a very remarkable manner little liable to change, as its skin, its nerves, and vessels, the lining membrane of the urethra, and more especially its ligamentous sheath. Many months are required for the decomposition or disintegration of any one of these parts; and some of them after twelve months' maceration in water, changed daily, or every second day, still retain their form, and are only partially corroded or wasted; as the skin of the *glans penis* and its internal structure, and as the ligamentous sheath of the *corpus cavernosum*. The process of change in all these parts, appears to be very similar in kind to that of the *dura mater*, though much slower, excepting the upper part of the urethra, where that membrane is very thin, and where contiguous to it are numerous mucous glandules, which undergo change rapidly, and seem to accelerate its change. The process of change appears to be by the formation of a mucus-like substance, which in the penis I have noticed of very various colours, as pink, dull-brown, bright-brown, orange, and green. It is preceded by softening of the parts; it takes place chiefly at the surface, or in the portions most exposed to the action of the water; it is not agreeable; but, as in the *dura mater*, spreads as it were from certain points or centres, reminding one of ulceration, the part affected seemingly protecting the contiguous part within certain limits from change.

Tendon (4, &c.)—This part under my observation has undergone change very slowly; and the less mixed it has been with other tissues, so much the less prone has it been to alteration. I have a portion of *tendo Achillis* of a limb amputated on the 16th October 1828, which has been in constant maceration, and yet it is but little changed; the longitudinal fibres are still strong; and when the adhering brown mucus-like substance, which has formed in small quantity on the surface, is rubbed off, they exhibit their original colour and lustre. The connecting tissue of the fibres has been either destroyed or rendered very soft, and in consequence the longitudinal fibres are easily separated. Tendons, at their origins and insertions, where most mixed with other textures, change more rapidly; but even there it seems to be rather a disintegration or separation of fibres than a decomposition of them, and amongst the debris tendinous fibres may always be found, on careful examination, little altered; at least so it has happened in my experiments. The change to which tendon is liable appears to be the same as that noticed under the head of the penis.

Synovial membrane (4, 10.)—This membrane has lost its firmness like serous membrane, and its surface has become slimy. With the exception of a few tendon-like fibres, or shreds composed of those fibres and cellular tissue, it has disappeared during a course of maceration of about four months; and the fatty appendices have been apparently converted into adipocire.

Perichondrium and Periosteum.—Both these tissues have undergone change much in the same manner, and at the same rate in relation to time, as the *dura mater*, where they have been detached by dissection from the parts which they enveloped. When they have not been detached, their change has been modified by the influence of the contiguous surface, and sometimes apparently retarded, and sometimes apparently accelerated. These remarks apply chiefly to the perichondrium of the cartilages of the ribs, and the periosteum of the cylindrical bones. The perichondrium and periosteum of other parts, according to a variety of circumstances, suffer alteration variously, and especially according to their degree of thickness; thus, when very thin and loose, resembling cellular membrane, the periosteum of the inside of the lower jaw disintegrates rather rapidly, like the adjoining cellular membrane, from which it is extremely difficult to distinguish it, and to say where the one begins, and the other terminates.

Cartilage (4, 10.)—From the observations which I have made, cartilage and fibro-cartilage appear on maceration to undergo slowly a very similar change, and to waste away gradually, from being converted into a mucus-like substance. During the change, the colours which I have witnessed in some parts have been various and extremely bright; especially in the cartilage of the *symphysis pubis*; I have seen it partially vividly coloured, brown, orange, blue, green and yellow.

Bone, (4, 10.)—This structure undergoes change from maceration very slowly, especially the compact bones, which contain few vessels and little blood. Changing the water frequently, the animal matter appears to be slowly removed; for there is a constant exudation of a mucus-like substance on the surface, and the brittleness of the bone gradually increases. Various bones, now under observation twelve months, have not yet lost the whole of their animal matter, not even the most delicate, as the fine plates of the ethmoid and the spongy structure of the turbinated bone. When the water of maceration is not changed, perhaps the results are different. I am led to this inference from having on one occasion found the bones of a bird, which had been in the same water about a year and half, not become brittle, but flexible, from loss of a portion of their phosphate of lime; but how this happened I do not know; it would seem to indicate the generation of an acid capable of dissolving phosphate of lime; and yet it is difficult to admit this, as the proportion of carbonate of lime in the bones was not apparently diminished.

Intervertebral substance.—I know no part of the body so little changed by maceration as this. Portions of it from different bodies which have been in water from eight to twelve months, retain their form, are very little altered in appearance, and have lost little of their substance. The central soft part, almost of gelatinous consistence in the recent subject, has been the part principally affected; it, in the five mentioned, has gradually wasted and disappeared. The outer layers, on the contrary, have suffered least; and they now retain, as well as I can judge, their original firmness; and, when the minute quantity of mucus-like substance which has formed on their surface is washed off, they exhibit their original colour.

4. *General Remarks and Conclusions.*—The changes produced by maceration, or during the process, are referrible, I believe, to three distinct causes. 1*st*, To chemical causes, giving rise to new combinations of the component elements, and to new productions with the aid of the oxygen dissolved in the water. 2*dly*, To insects, those which constitute the family of *Infusoria* of Linnæus, (many of which appear to be larvæ,) feeding on the animal matter. In many experiments, the larva of the common gnat of Malta has been very abundant and active as a destroying agent, performing, in relation to change of form of matter, a part in water similar to that performed by the larvæ of flies or dead animal substances in the air. 3*dly*, To the operation of vegetation of those obscure plants, belonging principally to the *Confervæ* of the Swedish naturalist, and which in my experiments have invariably appeared, if the process has been at all protracted; and commonly either as fibres shooting from the part in straight lines, sometimes an inch in length, or, more obscurely, as a fine velvet-like protuberance or growth resembling a byssus. The former kind has appeared most remarkably on the neurilema, on the cutis of *glans penis*, on its ligamentous sheath, on the *tunica albuginea*, and on the bones, especially the spongy bones. The latter kind has occurred chiefly on the debris of ligamentous and fibrous parts.

The first, or the chemical causes, must be considered as the main ones; and the second and third only as auxiliary, and, in relation to effect, infinitely inferior in activity. The changes chemically produced I have not yet attempted to investigate with any minuteness. I suspect they are in most respects similar to those which occur during putrefaction in the open air, modified in a certain manner by the solvent power of the water, and, moreover, modified by the removal mechanically by the water of the particles detached and not dissolved. I have ascertained that the same gases are disengaged from the different textures during putrefaction in the atmosphere, and during maceration or putrefaction in water; and, as far as I am able to judge from a slight examination, the insoluble debris, generally resulting in both, does not materially differ. The most striking difference which occurs in considering the two processes is in relation to time, most parts undergoing change more rapidly in the air than in water, that is, when there is as free an access of air as of water. The difference is probably owing to the water removing a substance, which may be called animal leaven, very apt to decompose itself, and to promote the decomposition of animal and vegetable matter, with which it may be mixed, which abounds in, and forms a considerable part of, all the textures liable to change, and exists more sparingly in those parts which are slow in changing.

I had it in contemplation to compare the results of my experiments with those of Bichat, as given in his Anatomie Generale, and I have made notes for that purpose; but, considering the length this paper has already reached, I shall defer it for the present. I may, however, remark, that many of them differ, and very essentially, and in some instances in a manner that cannot be explained in a satisfactory way, by the forms of the experiments not having been exactly the same.

The general conclusion which I am disposed to draw from these experiments is in opposition to the doctrine of Bichat on the subject of membranes; a doctrine, it must be confessed, which bears the impress of genius; but, I apprehend, rather a fiction of the mind than a well-grounded theory or generalization of facts. In the present state of our knowledge, it appears to me that the doctrines of Haller, on the composition of the textures of the body, are preferable, both in relation to matter of fact and utility of application, to the more modern ones of the French school. It seems to be taken for granted in the new doctrine, that continuity of surface is necessarily accompanied with identity of structure. If the doctrine be correct, this dogma may be admitted; but if the latter is not correct, I do not know how the doctrine itself can maintain its ground. And it appears to me that facts have been advanced in this paper not reconcilable with this dogma. Compare the effects of maceration on the textures of the different passages or canals communicating with the open air; or compare the effects of this process on different parts of the surface of the same canal, and certainly identity of composition is not indicated, but considerable variety. Make the same kind of comparison with different parts of the *cutis*, and the conclusion is analogous. Far different in composition and in appearance, and in the morbid affections to which they are liable, are the *cutis* of the sole of the foot, the *cutis* of the *scrotum*, of the chin, and of the back.

Malta, September 30, 1829.

ART. VII.—*Observations upon Arsenic.* By ALEXANDER MURRAY, M. D. and A. M., Licentiate of the Royal College of Surgeons, Edinburgh.

IT will, I believe, be admitted that it is, for obvious reasons, of greater importance to distinguish arsenic in a satisfactory manner than any other substance which it is possible to name. An accidental observation upon it in the solid form has led me to turn my thoughts at present to the subject, and some of the experiments consequently made are, I trust, worthy of attention, since they appear to prove that there is no substance in nature of which a very minute quantity can be detected, with so much ease, certainty, and quickness, as common arsenic. Considering that the best writers occupy in general several pages with a detail of processes for distinguishing this powder, some of them little satisfactory, and the rest neither without difficulty, nor even in the best hands, entirely certain of succeeding, it is of some moment to know, that a method can be described which may be understood and practised in a single minute, whereby any one, however unaccustomed to investigations of this nature, may detect the smallest quantity of white arsenic. It is, however, at once conceded, that I ought to claim for myself little or no merit in the matter, since the method to be proposed is derived from principles already sufficiently established, being, indeed, only an obvious extension, and, I may say, modification of the tests which are at present in use, for another form of the same substance.

It may be proper to notice that the best authorities direct arsenic to be distinguished by the following circumstances— the alliaceous odour of its fumes, (which, however, in smell, appear to me to resemble phosphorus more than garlic); the silvery stain produced upon copper, when heated in contact with arsenic; the effect of certain tests upon the solution of this substance; the reduction of the powder to the state of a metal, and the conversion again of this into the oxide of arsenic, by means of heat. It may be added, that Dr Christison, our most distinguished authority in matters of the present kind, prefers the reduction, and subsequent oxidation of the metal. The experiments which point out a far easier, and, I am inclined to believe, a more certain and delicate method, are as follow.

1. A small quantity of common arsenic was pressed into writing-paper by friction with a glass rod, and upon the stain thus produced, a single drop of a solution of common nitrate

of silver was rubbed by means of the rod. A phial containing common hartshorn was then immersed in hot water, and over its open mouth, the paper was held (the arsenic being on the upper surface, for the sake of better observing the appearances) when the whitish spot became in a few seconds lemon-yellow. The arsenical spot being kept over the hartshorn for about half a minute more, the yellow colour entirely disappeared, but it returned when the paper was removed from the phial and held close to the water.

2. Upon an arsenical stain of the kind described, was rubbed a drop of solution of sulphate of copper, and the paper was then held over hartshorn placed as before. Almost immediately, a mixture of blue and green streaks was perceived, and in a few seconds more, the spot became of a beautiful blue colour. The paper was then removed from the hartshorn and allowed to float upon the hot water, when the blue in a few seconds was converted into a decided green.

I am disposed to believe that either of these easy experiments is quite conclusive. Jointly, they form a proof which appears liable to no possible objection. They may be varied in many different ways, as the following statement shows.

3. A spot was prepared with arsenic and sulphate of copper, (as in the last experiment,) upon which a single drop of hartshorn was placed, when the whole spot after a short interval became of a green hue.

4. A spot was prepared with arsenic and nitrate of silver, (as in experiment 1.) A drop of common hartshorn being added to it, caused a fine lemon-yellow colour.

5. Arsenic was put on paper, as in the former experiments, and a minute quantity of liquid ammoniacal sulphate of copper was smartly rubbed upon the spot, when it soon became of a green colour.

6. A very small quantity of the ammoniacal nitrate of silver was rubbed upon an arsenical spot, and an immediate yellowness was the consequence.

In the first two experiments the strength of the ammonia materially influences the rapidity of its effects; and the same circumstance in experiments 3 and 4 regulates the exact nature of the changes, which accordingly are of several different and curious kinds. It is unnecessary to detail these various appearances; but one of the most singular may be mentioned, which sometimes is observed when a drop of hartshorn is added to the mixture of nitrate of silver and arsenic, namely, a lemon-coloured ring surrounding a colourless centre. The whole spot, however, after a little time, assumes the yellow appearance. The appearances produced by putting a drop of hartshorn upon paper, on which arsenic and solution of sulphate of copper have been mixed, as in experiment 3, deserve to be slightly alluded to—the central portion loses its blueness by exposure, and, in proportion as it does so, the greenish margin gets more and more of the bluish hue; and indeed every variety of green may be seen in this experiment. Ultimately we have in general a verdigris ring surrounding a spot whose colour is a green not very distant from yellow. Weak hartshorn seems fittest for 3 and 4, and the stronger kind for 1 and 2. When the ammoniacal sulphate of copper is used, the colour varies with the strength of the test, from a green, which may be called passing into blue, to the same colour about to pass into yellow, the former modification being produced when the preparation of copper is strong, and the latter when it is much diluted with water. When the test is of a medium strength, the colour produced with arsenic is of an intermediate kind, being grass-green, or emerald-green.

The preceding method has various advantages over the application of tests to arsenic, after it has been brought to a state of solution,* and still more is it preferable to trusting to the odour of the fumes, or the alloy formed with copper. It is enough, however, to compare it with the mode of proceeding at present the most esteemed, viz. the reduction and subsequent conversion of the metal into the oxide of arsenic.

In the *first* place, it may be mentioned, that, by any of the methods suggested by this paper, it is easy to detect a quantity of arsenic much less than the most skilful chemist can reduce to the metallic state. Few persons can depend upon *reducing* 1-20th or even 1-10th of a grain of arsenic, but I feel convinced that it is *easy*, by the methods here suggested, to detect 1-500th part, and *possible* to detect 1-1000th part of a grain, and perhaps a smaller quantity of arsenic in the form of powder. As a proof of this, I have just now taken one carefully-weighed grain of white arsenic, and spread it out as much as possible upon common writing-paper, and, by means of the ammoniacal nitrate of silver, I have, with great ease, and even in a hasty manner, made upwards of 400 separate and distinct yellow spots. Many of these are double the size of others, and more than four times the size of what might be very easily seen; and a considerable portion of the arsenical stain is unoccupied, for the sake of making the spots clearly separate. Further, having reason to think that most of the other modes adopted in the experiments are equally delicate as the ammoniuret of silver, I feel, for these reasons, fully at liberty to make the above assertion. It is, at least, certain, that, following one or other of the methods suggested in this paper, we may distinguish the smallest portion of arsenic that has any chance of being submitted to examination,—indeed, almost as small a quantity as can be clearly seen by the sharpest eye.

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* This substance is of difficult solubility, and we certainly cannot safely trust to being able to make a solution of it when the quantity is very minute,—perhaps so minute as to be barely a fit subject for any kind of *manipulation*. The arsenites, too, when formed upon paper, are much fitter for accurate inspection than when viewed through a liquid medium, and they may likewise be readily carried to a distance, and shown to many individuals, even after a considerable lapse of time. The arsenite of silver, if secluded from the light, may be tolerably well preserved for a considerable length of time; and, as to the arsenite of copper, my impression is, (though I have not fully verified the opinion,) that, upon paper, it will keep its colour distinctly for many weeks or months, and perhaps much longer. It may be added, that the fallacies attributed to the copper and silver tests affect only arsenical solutions, and do not come into operation when the powder is used. In fact, there is not known to me any source of error in the case of treating white arsenic as pointed out by the preceding experiments, if we keep in view the single consideration, that ammoniuret of silver produces with phosphate a similar appearance as with arsenic.

A method calculated for extremely minute quantities of arsenic is not a circumstance of slender importance, since it has not very seldom happened in medico-legal investigations, that it has been necessary to examine a very minute quantity of powder suspected to be this poison, derived from articles of food, with which it had been mixed; or procured from the stomach, either adhering to the surface of that organ or mixed with its contents. Farther, the methods now suggested are not only less troublesome and more delicate than the test by reduction, but they are also free from the chance of failure, to which it is in some degree liable, I am aware that the reduction-test will in general succeed, and that it may even happen to do so completely, in the hands of one who has never before tried or witnessed the experiment, but it is, on the other hand, certain, that he who has repeatedly produced the metallic crust will occasionally fail in his object, owing, perhaps, to accidental peculiarities in the flux made use of. As to Dr Turner's ingenious process for converting the metallic crust into common arsenic, I shall not discuss its merits, as the preceding arguments are valid, even considering it possible to distinguish metallic arsenic with unerring certainty. It is enough to say, that Dr Turner's process ultimately depends upon distinguishing the powder of arsenic by the eye, and it may be plausibly argued, that, having reduced white arsenic to the metallic form, we gain, at least in this case, but little, by converting it again into powder, which is to be judged of by the eye; since, if ocular inspection had sufficed, the whole steps were unnecessary. It is but fair to add, that I have not a sufficient knowledge of this process for properly forming an opinion regarding its merit; and I know that a far better judge, the present Professor of Materia Medica at Edinburgh, holds it in the highest estimation.

Admitting the utility of the processes suggested in this communication, to know exactly in what they differ from former methods is of comparatively little importance. It is, however, not amiss to say that the application of liquid tests to arsenic in the solid form has not been hitherto practised; nor have I reason to think that any one is aware of the ease and celerity with which this powder can be made to unite with the oxides of copper and silver. The manner of applying ammonia, adopted in experiments 1 and 2, is also new, and not only forms a rather elegant chemical experiment, but is farther a far better way, as I think, of introducing an alkali, than any method which has been previously in use. The effects of the ammonia may be thus explained in a general way. When a certain quantity of this vapour is added to a combination of sulphate of copper and arsenic, a double attraction is brought into play, which causes the formation of the green arsenite of copper. Continuing to apply the fumes, we produce the blue colour usually struck between copper and ammonia, and, indeed, it is not always easy to prevent this occurrence even from the first; for the blue is not preceded by green, unless the ammonia is cautiously applied. The blue ammoniuret of copper prevents or obscures the formation of the arsenite, which, however, becomes apparent when the blueness is removed upon dissipating the ammonia by means of heat, or by exposure to the atmosphere for some time. Again, when a combination of nitrate of silver with arsenic is exposed to hartshorn, the yellow arsenite of silver is the consequence, while a greater quantity of the vapour removes the colour by dissolving the salt. Afterwards, heat restores the yellowness, obviously by dissipating the excess of ammonia.

The method of discovering arsenic made use of in experiments 1 and 2 may be advantageously applied to detect this substance when dissolved in water. Let a drop of this solution be put on white paper, and after the wet spot has been rubbed over with nitrate of silver, or sulphate of copper, it is to be exposed to ammonia, when the same changes take place as in experiments 1 or 2.

I have now alluded to the advantage of using ammonia in the gaseous form, whether the arsenic is solid or in the state of solution; and the grounds of preference may next be more particularly mentioned. Let the silver test be first considered. At one time the fixed alkalies were added to the arsenical solution, after which the nitrate of silver was dropped in. In this method, however, when a phosphate exists in the liquid, a yellow precipitate takes place, similar in appearance to the arsenite of silver; and, besides, the alkali and the nitrate act upon one another, and thus create a confusion in some cases. As an improvement, ammonia was used instead of the fixed alkalies, and was added to the arsenical solutions either before or after the nitrate of silver; but this was found an uncertain plan, as the success depends upon a definite quantity of ammonia being used. To obviate this difficulty, the ammonia was added to the test, and it was believed that the ammoniacal nitrate of silver possessed the double advantage of not acting upon phosphates, while it wanted the difficulty arising from any error in the quantity of ammonia. It does not appear to me that this test possesses fully either of the advantages ascribed to it. There is no very decided rule for the formation of the ammoniacal nitrate, and if we add too little ammonia, it does not act upon arsenic, whereas if too much is added, the yellow arsenite is never seen. The assertion, that the ammoniacal nitrate of silver does not disturb the phosphates, is also incorrect, for it acts upon these salts and their solutions, or at least upon some of them, in the most evident and ready manner.*

By applying ammonia in the gaseous form, every one of the above sources of error and difficulty is avoided. In the case of solid arsenic, this method is without a single objection so far as is known to me; and in solutions, it is free from all the fallacies attached to the fixed alkalies and to liquid ammonia, while there is no objection peculiar to itself. As a short rule, it may be stated, that if the addition of nitrate of silver to a suspected powder or liquid produces no change, while yellowness is the consequence of afterwards applying the fumes of hartshorn, this colour cannot depend upon the presence of a phosphate or of any known substance, except arsenic. As to the mode suggested by experiment 2, of applying ammonia, along with sulphate of copper, to detect arsenic, whether solid or dissolved in water, it is enough to say that it seems altogether unobjectionable. It is free from the errors which may interfere when the liquid ammoniacal sulphate of copper is used, while it appears to me more delicate, and has no source of fallacy of its own.

It is not to the chemist and medical jurist alone that observations on the powder of arsenic are interesting. They are in some cases no less so to the medical practitioner, strictly so called, who is occasionally called upon to prescribe for symptoms supposed to arise from arsenic, in which case it would be, to say the least, very satisfactory to determine their cause by a process occasioning neither trouble nor delay, and by means of materials which are almost always within reach. In such a case, if any whitish powder, however little can be procured, whether adhering to wrapping-paper or from any other source, I would advise that it be rubbed upon paper by any common means,—say, with a penknife. Then let a stick of common lunar caustic moistened in water be drawn two or three times across the spot, and if now no change of colour occurs, but if, upon the subsequent addition of ammonia, whether gaseous or liquid, a bright yellowness is produced, the suspected powder is arsenic. If the materials are sufficient, another trial can easily be made by substituting blue vitriol (which, to save trouble, may be used in the solid state,) for the caustic; when, supposing arsenic present, blue or a greenish blue will be caused by the hartshorn, which colour will in no long time turn into grass-green upon exposure to air, particularly along with heat.

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* Since this observation was made regarding the effect of the ammoniacal nitrate upon phosphates, I find that Dr Christison appears to have noticed the same thing, at least in the case of the solutions.—He says, "the phosphate of silver is so soluble in the ammonia of the test that no precipitate is caused, unless the phosphate in solution is very abundant."—(*Treatise on Poisons*, p. 192.)

Those who have a recollection of Dr Paris's work on Medical Jurisprudence may suppose, that the experiment wherein a stick of caustic is drawn across an arsenical spot made upon paper is derived from that source; and I do not mention the matter for the sake of contradicting this, so much as for a more important object. Paris says,* "drop the suspected fluid on a piece of white paper, making with it a broad line; along this line a stick of lunar caustic is to be slowly drawn several times successively, when a streak is produced of a colour resembling that known by the name of Indian yellow, and this is equally produced by the presence of arsenic, and that of an alkaline phosphate; but the one from the former is rough, curdy, and flocculent, as if effected by a crayon; that from the latter is homogeneous and uniform, resembling a water-colour laid smoothly on with a brush. But a more important and distinctive peculiarity soon succeeds, for in less than two minutes the phosphoric yellow fades into a sad green, and becomes gradually darker, and ultimately quite black; while, on the other hand, the arsenical yellow remains permanent, or nearly so, for some time, when it becomes brown."

I am very far from being anxious to discover errors in the work of Dr Paris; but I must observe, that the above passage is by no means quite correct; and farther, that, though his experiment is admirably calculated for the end in view, namely, for distinguishing arsenic from phosphates, it answers the purpose in a very different way from that set forth in the quotation. In fact, the value of the experiment does not consist in a comparison of the yellows, (for there can be no such comparison,) but shortly in this: Nitrate of silver produces no change of colour with arsenic; but with a phosphate it readily occasions a beautiful yellow. Notwithstanding Paris's specific experiment, and also the general assertion of Orfila, Gordon Smith, and other chemists, both at home and abroad, that nitrate of silver causes a yellow precipitate with solutions of arsenic, I venture to say that the opinion has no kind of foundation. Nitrate of silver, whether solid or in solution, has no perceptible effect upon arsenic, either in powder or dissolved in water; but it acts readily upon phosphates and their solutions, producing the yellow phosphate of silver. I find, farther, that a combination of ammonia and nitrate of silver, in a certain proportion, acts upon phosphate of soda, but not upon arsenic; and that there is another combination of the same ingredients, wherein the ammonia is rather more abundant than before, which produces a yellowness both with arsenic and the salt mentioned; another combination, containing a still greater proportion of ammonia, which produces a yellowness with arsenic, but not with the phosphate; while, lastly, there is a fourth combination, in which the ammonia is still farther increased, that has no perceptible action, either upon arsenic or phosphate of soda.

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* Vol. ii. 241.

I must now conclude, in the hope of making a future communication upon the same subject.

Aberdeen, 22d February 1834.

ART. VIII.—*Cases of Mental Derangement terminating fatally, with the Appearances disclosed by Inspection.* By JOHN SMITH, M. D. Fellow of the Royal College of Physicians, Edinburgh, and Physician to the City Charity Work-House and Lunatic Asylum.—(*Concluded from p.* 69.)

21st. MUNGO RAMSAY, æt. 55, dark hair, and swarthy complexion, stout-make, unmarried, had been for many years subject to attacks of periodical insanity. The intervals between the paroxysms were often of several months' duration; but his mind had become much weakened, and he also laboured under a considerable degree of imperfect general paralysis, more particularly of the lower extremities.

In consequence of this he had been long bed-ridden, and his back having sloughed from the continued pressure of constantly lying upon it, and the greatly weakened state of the nervous system, he sunk on the 20th November 1830. During his illness he had occasional slight attacks of maniacal delirium.

Examination.—Head.—The skull over the frontal sinuses was fully half an inch thick, and their cavities were completely filled up with bone. In other parts it was natural as to thickness; but everywhere it exhibited increased density and hardness. The membranes showed nothing preternatural. The brain was generally soft, but more particularly in the parts forming the parietes of the ventricles. There was no congestion or effusion.

Thorax.—There were extensive adhesion between the *pleura pulmonalis* and *costalis* on both sides. The lungs were healthy, and the heart had undergone no morbid change.

Abdomen.—On opening the parietes, the colon was seen very much enlarged and filling all the centre,—the small intestines being pushed to the sides. The *caput cæcum* was very much enlarged; and the colon, instead of ascending in the usual way to form the transverse arch, turned suddenly at the lower margin of the liver towards the *umbilicus;* it then rose to the epigastric region, and, making two large convolutions, completely filled this region and the umbilical; it then descended tortuously on the left side,—the sigmoid flexure, as well as the rectum, being very much enlarged. The liver was rather increased in size, and granular; the gall-bladder, natural as to size, was full of pale-coloured bile. The stomach was large, but was hid by the colon. The kidneys were natural. The spinal marrow was examined in the lumbar region, but it exhibited no decided morbid change.

22d. Rebecca Shillinglaw, æt. 33, fair complexion, tall and slender-make, unmarried, a servant, was admitted into the Asylum on 26th December 1828, in a state of melancholy, accompanied with great excitement. The attack commenced about six months before. She supposed that she had brought ruin upon all her friends; and she seemed to suffer much distress from the idea, that she had had several children; whilst she at the same time declared that she never was with child, and appeared most anxious to convince all about that such was the case. Her agitation and apprehension were very great. She was in constant irritation. She was also very suspicious; and she often refused her food from supposing that poison was mixed with it. A few weeks before her death she fancied that she was to be married; and from this time her irritability increased, and, believing every day to be her wedding-day, she begged to be sent to her friends, as they were all anxiously waiting for her, and had every thing prepared. Her strength, which for a long time had been gradually giving way, now sunk rapidly; she became hectic, and died on the 3d April 1831.

Examination.—Head.—The scalp was thin, and was easily raised from the pericranium. The skull was of natural thickness, and nothing morbid was observed in the state of the membranes but slight serous effusion under the *pia mater.* The brain, of natural firmness, was quite free from congestion. The lateral ventricles contained about half an ounce of serum, and there was also a little in the fifth. The *corpora quadrigemina* appeared smaller than usual.

Thorax.—The left cavity contained a large quantity of serum, full of flakes of coagulable lymph. The lung was shrunk and soft. Between the *pericardium* and left lung adhesion had taken place, so as to form a sac, which also contained serum with flakes of lymph floating in it. The right lung was quite healthy. The heart was of natural size, and there was no effusion into the *pericardium.*

Abdomen.—The stomach was very large, and extended as low as the left lumbar region. The *duodenum* was very much contracted, as was also the colon. The mucous coat of the *rectum* and lower portion of the colon was thickened and congested, and covered with a dark-coloured secretion. The other *viscera* appeared healthy.

23d. Mary Carr, æt. 50, dark hair, and swarthy complexion, stout-make, unmarried, from the country, was admitted into the Asylum on the 5th February 1830, in a state of melancholy, accompanied with considerable excitement. She supposed that some serious injury was about to befal her. She also fancied that whatever nourishment she took never passed through her, but that it lay accumulating till she should burst. Under this impression she refused all sustenance, so that all her meals had to be forced. No amendment taking place in the state of her mind, her strength at length gave way to her determined denial of all food. She became emaciated; cough and purulent expectoration followed; and she lingered in a state of hectic fever for several weeks, and died on the 7th August 1831.

Examination.—Head.—The scalp was thin, but was strongly adherent to the *pericranium.* The skull was of natural thickness and density. The membranes appeared free of any morbid change. The brain was soft and exsanguineous, particularly in the parts forming the ventricles. In the course of the *tænia semicircularis* there was a slight mucous deposition. The choroid plexus was not congested. The *cerebellum* was fully as soft as the brain. The posterior clinoid processes were somewhat carious, and broke down on being lightly handled.

Thorax.—The left lung was throughout diseased, and its *pleura* adhered closely to the *pleura costalis.* Its lower half was one large abscess, and its upper was full of *vomicæ.* The heart was small, but free from disease. The right lung, with the exception of a few tubercles, was sound; and there were no adhesions between it and the *pleura costalis.*

Abdomen.—The intestines were of a dark livid colour and congested, and lying chiefly on the right side. The *caput cæcum* filled the right side of the pelvis, and the *uterus* was pushed to the left. The other *viscera* were sound.

24th. Anne Fraser, æt. 55, dark hair, swarthy complexion, stout-make, was admitted into the Asylum on the 23d August 1817, in a state of deep melancholy. She was very silent, and seldom spoke, but to express her fears of her future welfare. She went about, wringing her hands, and uttering heavy groans; and her countenance bespoke a great degree of agony and despair. She was solitary, and very rarely excited. About a year before she died, her health began to give way. She complained of great oppression in the right side, accompanied with short cough. From this period there was a slight improvement in the state of her mind; she became somewhat communicative, although her prospects of the future continued very gloomy. The pectoral symptoms gradually increased, and were followed by diarrhœa; and she sunk on the 29th July 1831.

Examination.—Head.—The skull was of natural thickness, the membranes were free from congestion, and there was no effusion between them. The brain was soft and exsanguineous, particularly around the ventricles, where the parts were in a state of incipient *ramollissement.* The posterior *cornu* of the left ventricle was larger than usual. The *cerebellum* and base of the brain were very soft.

Thorax.—Whilst dividing the ribs of the right side, the *pleura costalis* was wounded, and a considerable quantity of purulent matter escaped. The sternum being raised, the right cavity of the chest was found to contain about three pounds and a-half of purulent matter, and the lung was shrunk into a small flat membranous substance. The sternum and ribs on the right side were soft and spongy. The pleura was very much thickened. The pericardium was adhering to the heart and large blood-vessels. The left lung was very much enlarged, and completely filled that side of the chest. It appeared in other respects sound. The aorta, from the commencement to its bifurcation, contained a number of large bony deposits, and at this part it was almost entirely ossified.

Abdomen.—The stomach and liver were sound. The spleen was large, firm, and lobulated. The colon was generally congested, and different portions of it were of a deep livid colour.

25th. William Cunningham, æt. 73, swarthy complexion, tall and stout-make, married, a carter, was admitted on the 19th January 1831. He had been insane for about a year, and was affected with imperfect paralysis of the legs. He was very incoherent and talkative, and swore much. He seemed to have a particular aversion to his wife, as he never mentioned her name but he added some opprobrious epithet. He was subject to fits of screaming and bawling to a great degree. His habits were reported to have been dissipated. He died on the 19th September of the same year, very much exhausted, and having been for some days previous in a state of coma.

Examination.—*Head.*—The skull was of natural thickness, and, on raising the skull-cap, a considerable quantity of serum escaped. There was attached to the inner surface of the *dura mater* a flat gelatinous organized mass, covering the greater part of the right hemisphere. It was cellular in its structure, with a thin external coat; and red vessels were seen running through it in all directions. It was also attached to the right transverse spinous process of the sphenoid bone. The *dura mater* was firmly adherent to the skull, but it was rough, and less dense than natural. The arachnoid coat and *pia mater* were both very much thickened; and between them there was very extensive gelatinous deposition. The *glandulae Pacchioni* were much enlarged. The brain was soft and exsanguineous. The lateral ventricles contained no serum, but the left was very much dilated, particularly its posterior *cornu*, which filled the greater portion of the posterior lobe, the outer surface of which was in a state of ulceration. There was great thickening of the arachnoid coat and *pia mater* at this part. The lining membrane of the ventricles was very much thickened, and the *septum lucidum* felt almost cartilaginous. In the course of the *taenia semicircularis* there was considerable gelatinous deposition. The pineal gland contained a small white substance. The *cerebellum* had undergone no particular morbid change.

The viscera of the thorax and abdomen were sound.

26th. Thomas Flannagan, æt. 37, fair hair and sallow complexion, tall and stout-make, married, a shoemaker, was admitted on the 4th October 1830, in a state of high excitement. He had been ill for five days, and previous to that he had been drinking much. He fancied that he had immense wealth,—that he had warehouses of gold,—and that he was himself made of gold. His ruling idea was gold, for every thing he thought of was immediately converted into gold by his diseased imagination. In speaking of the money he fancied he possessed, he never mentioned a smaller sum than millions and tens of millions of sovereigns. He underwent a great deal of treatment, but nothing gave a check to his golden delusions. About the beginning of December 1831, he became dull and stupid, he passed his urine and feces involuntarily, and had great difficulty in articulating. These symptoms were followed by dysentery; and he sunk on the 4th January 1832.

Examination.—Head.—The scalp was thick, and adhered firmly to the pericranium; the skull was of natural thickness; the frontal sinuses were large, particularly the left; the *dura mater* was congested, and there was considerable serous effusion under it. Such was also the case between the arachnoid coat and *pia mater.* Both these membranes were thickened, and the *pia mater* was very vascular. The anterior lobes of the brain were adhering firmly together. The brain was preternaturally firm, dense in all its parts, and felt heavier than usual; the cerebellum was in the same state. The brain near its surface was much congested, but less so in the centre. The lateral ventricles contained no serum; but their lining membrane was much thickened, and the left anterior *cornu* was large and deep. Considerable serous effusion was found under the *tentorium;* and a vesicle about the size of a common nut, and full of a limpid fluid, was attached to its anterior margin. At the junction of the anterior and middle lobes on each side, the brain appeared as if it had been compressed by a tight cord. The posterior clinoid processes were more elevated than usual, and the space between filled up with bone. The point of the left was sharp.

Thorax.—The lungs were large, and completely filled the cavities of the thorax. The upper and under lobes of the right lung were hepatized; and several abscesses, covered with a dark grumous secretion, were found in the superior lobe. The middle lobe was healthy. The left lung was diseased in a similar manner, but not to the same extent. The pericardium contained about two ounces of serum. The heart was sound.

Abdomen.—The stomach was large, and numerous streaks of a dark colour, as if made by the application of caustic or China ink, were observed running transversely, chiefly at its pyloric extremity. The liver appeared to be healthy, and the gall-bladder contained a small quantity of bile. Numerous ulcers, some the size of half-a-crown, and covered with a dark-coloured secretion, were found in the course of the colon. None were observed in the rectum. The small intestines were covered with an ochre-coloured secretion, but were free from ulceration. The kidneys, particularly the right, were fully twice their natural size, but their structure appeared healthy. The spleen was large and soft. The pancreas, though enlarged, appeared to be sound.

27th. Mrs Morrison, æt. 47, dark hair, sallow complexion, slender make, was admitted on the 13th December 1831. She was much excited, and in great fear as to her future welfare. She had been insane about twenty years before; and the present attack was of nine weeks' duration. Her bodily health was very weak. She died from dysentery on the 8th February 1832.

Examination.—The body was much emaciated.

Head.—The skull was of natural thickness. The frontal sinuses were very large, and extended backwards beyond the middle of the orbitar plates. The *dura mater* was rather congested, and there was a small quantity of serous effusion under it. Between the arachnoid coat and *pia mater* some serous fluid had likewise been effused; and the latter membrane was much congested. The brain was firmer than natural, and near the surface it was considerably injected; towards the centre this appearance diminished. The lining membrane of the lateral ventricles was much thickened.

Thorax.—The viscera of this cavity were sound.

Abdomen.—The surface of the intestines generally was of a livid colour. The colon was much contracted, and its mucous surface was studded with numerous small ulcers. The ulceration extended a short way into the *ileum.* The other viscera were sound.

28th. Adam Meikison, æt. 40, fatuous from birth, and an inmate of the Edinburgh Charity Workhouse, died from the effects of over-eating on the 25th March 1832. He was in the habit daily of eating at least twice the regular allowance of the house, (which is ample,) and more largely when an opportunity offered. He was in his usual health two days before his death, when he complained of slight pain of abdomen, accompanied with retching. There was great distension of the bowels, and he was ordered a large dose of castor-oil. After making a large meal at dinner the day after, the pain and retching were much aggravated, and the distension became so great, that the descent of the diaphragm was completely interrupted. He died the following morning.

Examination.—*Head.*—The head was small and contracted in front. The scalp was very adherent. After the most minute inspection of the brain, no morbid change in its structure was discovered. The imbecility of mind must therefore have depended upon the small size of the organ.

Thorax.—The contents of this cavity were sound.

Abdomen.—The distension of the parietes was very great;

and as soon as they were laid open, the intestines forced their way out. The colon presented itself in front, and through its whole course it was preternaturally distended, its circumference having measured between fourteen and fifteen inches. It was quite full of a greenish-coloured pultaceous mass, having very little fetor. It was very much congested, and of a dark livid colour; and its mucous coat was covered with ecchymosed patches, varying from the size of a sixpence to that of a crown-piece. The great size of the colon excluded the other viscera from view. It compressed the liver very much; and in the left hypochondriac region it formed a large sac. The stomach was very much contracted, resembling more the duodenum a little enlarged. This intestine, as well as the small intestines generally, were of their natural size. The rectum did not partake of the great enlargement of the colon; on the contrary, there was a contraction at the head of the sacrum, and the calibre of the gut was not greater than that of the *ileum*. It was considerably thickened. The solid viscera were sound.

In this case, from the very diminished size of the stomach, the quantity of food taken at a meal was so much larger than it could contain, (being not less than two quarts,) that it must have passed immediately into the duodenum and small intestines, to be speedily deposited in the enlarged colon, which seemed to have become a general reservoir, as very little fluid was found in the small intestines, notwithstanding he had eat largely within a few hours of his death.

29th. William Ford, æt. 40, dark hair and swarthy complexion, tall and stout-make, unmarried, was admitted on 6th September 1823. He had been insane for some years, and believed himself to be the Lord Jesus Christ. He was haughty and contemptuous, cruel and morose, and never spoke but to insult. He continued in this state till the beginning of 1830, when he became gentle and kind. His mind, however, was now much impaired. He continued quiet and inoffensive till the 7th March 1832, when he was seized with typhous fever, under which he laboured in a state of high delirium till the 27th, when he expired.

On examining the head, the only morbid change observed was slight effusion between the *dura mater* and arachnoid coat, and under the *tentorium cerebelli*.

30th. Daniel Waters, æt. 40, black hair and swarthy complexion, short and stout-make, a sailor, married, was admitted on the 1st June 1830. This man was blind, and had led an irregular life. He was in the deepest despair as to his future welfare, and the thought of eternal punishment was constantly before him. When he felt the heat of the fire, he would cry out that it was hell-fire, and would not go near it. His dread of the future had not by any means softened his disposition; on the contrary, he was perverse and obstinate, and gave vent to the most horrid imprecations. At times he would scream out from the agony of his mental sufferings; but all offers of consolation he rejected with a sneer. He took his food with great reluctance. He died on the 13th January 1831 from dysentery.

Examination.—The body was much emaciated.

Head.—The skull was of natural thickness, but its density was much increased. There was considerable serous effusion between the arachnoid coat and *pia mater*. The membranes were not more vascular than usual, but the *glandulae Pacchioni* were enlarged. The brain was much firmer than natural, and much congested. There was no effusion into the ventricles. The optic nerves appeared shrunk. The left posterior clinoid process of the sphenoid bone was sharp and elongated. The cerebellum, though firm and congested, was not so much so as the brain.

Thorax.—The lungs were sound. The heart was rather large, the increase of size being in the left ventricle, the parietes of which were very thick and condensed. The *columnæ carneæ* were hard and ligamentous. The valves were free from disease.

Abdomen.—The colon was of a dark livid colour, and its internal surface was thickened, and covered with numerous small ulcers. The small intestines were much congested, but were free of ulceration. The submucous tissue of the stomach was highly injected. The liver was large, but sound in structure. The spleen was large, hard, and dry.

31*st.* William Dalgleish, labourer, æt. 62, dark hair, swarthy complexion, short and slender make, was admitted on the 27th July 1830. He had laboured under deep religious melancholy for six months; being without hope of the future, and in dread that he was for ever lost. He was quiet and tractable, although he took his food with reluctance, from the idea that it was of no use, his doom being fixed. His bodily health was very weak, and he sunk on the 21st January 1831 from dysentery.

Examination.—*Head*—The skull was of natural thickness, but very dense. The arachnoid coat was opaque, with slight effusion under it. The *pia mater* was much congested. The brain was very soft, particularly in the centre; and the left ventricle was in a state of incipient *ramollissement*. The fourth ventricle and *cerebellum* were also much softened. The eminences on the orbitar plates, and on the internal surface of the temporal bone, were prominent and sharp.

Thorax.—The lungs were sound; the heart was rather small.

Abdomen.—The surface of the intestines was of a livid colour. The coats of the colon and rectum were much thickened, and their mucous surface was elevated into ridges covered with a dark-coloured grumous secretion. These appearances were also observed at the lower extremity of the *ileum.* There was no ulceration. The mucous surface of the stomach and upper part of the small intestines presented numerous patches of inflammation. The other viscera were sound.

William Scott, labourer, æt. 29, black hair, swarthy complexion, stout-make, married, was admitted on the 27th February 1830. He became melancholy about a year before; and was in the habit of wandering from home, and neglecting his family. He was sullen, and very reserved, and very indolent; for he was always found sitting, lying, or resting in some way or other. He was under the impression that he had been injured by some one; and said, that when liberated he would carry a brace of pistols about with him. He was vicious and irritable. His health began to give way about three months before he died. He had cough with purulent expectoration, which was followed by diarrhœa. He seemed also to have considerable abdominal tenderness; but he was too sullen and reserved to express what he felt. He sunk on the 11th February 1831.

Examination—Head.—The skull was of natural thickness, the arachnoid coat was thickened, and there was considerable serous effusion under it. The *pia mater* was very vascular, and thickened. The brain was of natural firmness, but highly congested.

Thorax.—The lungs were very much diseased, having become quite tubercular, with numerous *vomicae.* The pleura was much thickened, particularly on the right side, and covered with a deposition of coagulable lymph.

Abdomen.—The internal surface of the peritoneum was covered with a thick coating of coagulable lymph. The intestines were all matted together, and adhering to the parietes.

33d. Margaret Walker, æt. 40, dark hair and swarthy complexion, slender-make, unmarried, was admitted on the 7th April 1824. She had been in a state of melancholy for some time previous, breaking out at times into violent excitement. She was very fretful and repining; and supposed that people came into her room during the night for the purpose of tormenting her. She seemed always anxious to prove that she was a decent girl; and used to say, that she was poor and harmless, and not above twenty. She died of consumption of the lungs on the 10th February 1831.

Examination.—Head.—The skull was very thin, and there was serous effusion, both under the *dura mater* and between the arachnoid coat and *pia mater.* The brain was rather soft, and exsanguineous.

Thorax.—The lungs were quite tubercular, with numerous *vomicae.*

Abdomen.—The stomach, instead of passing from the epigastric region into the right hypochondriac, descended as low as the left lumbar, when it turned to the right side. At the point of turning there was considerable contraction, so that it appeared divided into two. The other viscera were sound.

34th. William Macdonald, printer, æt. 33, dark hair, ruddy complexion, short and stout-make, married, was admitted on the 25th November 1827. He had been in a state of deep melancholy for several months, and imagined that he had brought ruin upon his friends, and that in consequence some severe punishment was to be inflicted upon him. He was constantly shaking from the great terror he was in, and he was timid and suspicious. He was removed by his friends improved on the 29th of the following February, and was readmitted on the 5th August of the same year in a state of high maniacal delirium. He was dismissed well on the 22d December, and was again admitted on the 21st of November 1829, in a state of deep melancholy. He continued for about a month in this state, when he became excited, and continued so with occasional calm intervals till the 5th April, when a degree of stupor and loss of memory was observed. On the morning of the 8th he was seized with convulsions, which continued with little intermission till the 10th, when he died.

Examination.—Head.—No congestion about the head or face. The skull was thick and very dense, and the different eminences in the base of it were strongly marked. There was a spicula of bone about a quarter of an inch in length projecting from the ridge of the petrous portion of the left temporal bone. The posterior clinoid processes were considerably higher than natural; the space between them was filled up with bone, and terminated in a sharp point. The internal surface of the frontal and parietal bones was very smooth, and without depressions. There was considerable effusion of serum under the *dura mater*, and likewise between the arachnoid coat and *pia mater.* On the upper surface of the brain these membranes were very much condensed. The *pia mater* was congested, and so was the upper part of the brain. The appearance of vascularity diminished towards the centre, and there was general softening of the brain.

The *viscera* of the *thorax* and *abdomen* were sound.

35th. Alexander Galloway, teacher of mathematics, æt. 35, black hair, and sallow complexion, short and slender-make, unmarried, was admitted into the Asylum on the 8th July 1830. He had been for a considerable time in a state of melancholy. He fancied that conspiracies had been formed against him for the purpose of ruining him, and that every one he met intended to insult him. He also supposed that poison was mixed with his food in small quantities, with the view of killing him by inches; and that there were reptiles and insects within him. He was sullen, irascible, and at times vicious, and frequently took offence at those about him for some imaginary grievance. He generally spoke with great asperity, which was increased by the difficulty he had in finding words to express himself. His bodily health had been indifferent from the time of his admission, and he sunk from dysentery on the 10th April 1833.

Examination.—Head.—The scalp was slightly adherent. The skull was rather thin, and a portion of the inner table, just about the *vertex*, and the size of half a-crown, had been absorbed, giving the part a cribriform appearance. The *dura mater* was opaque and denser than natural. The brain was generally soft, but more so in the parts forming the right ventricle. It was also very exsanguineous. The posterior clinoid processes were sharp and elongated.

Thorax.—The inferior lobes of both lungs were hepatized.

Abdomen.—The whole surface of the intestines was of a livid colour, and numerous small portions about the size of a sixpence were found in a state of softening and abrasion. This seemed to be confined to the outer coat. The mucous surface was in many places thickened and granular, and was covered with an ochre-coloured secretion similar to what he passed during life. There was no ulceration. The mucous coat of the stomach was softened, and of a dark colour. The liver was firmer than usual; but the gall-bladder contained a small quantity of healthy-coloured bile. The spleen was twice its natural size, and firm. The pancreas was enlarged and scirrhous, and there was attached to it a mass of a ligamento-cartilaginous nature, and stretching down a considerable way over the aorta and *vena cava ascendens*, but allowing a free passage to these vessels.

36th. Archibald Vallance, labourer, æt. 52, fair complexion, stout-make, was admitted on the 15th March 1832. He had been for several years in a state of fatuity, accompanied, however, with occasional fits of excitement. He died from dysentery on the 12th August 1833.

Examination.—Head.—The scalp was strongly adherent to the pericranium. The skull was of natural thickness, but much increased in density. There were two *exostoses*, flat, and about the size of a sixpence, near the centre of the external surface of the frontal bone, and one of a similar size near the centre of the right parietal bone. The membranes appeared natural, and there was no effusion between them. The brain was of natural firmness near the surface, but it became soft towards the centre, and the parts forming the ventricles, more particularly the right, were in a state of *ramollissement*. There were a number of vesicles in the course of the choroid plexus, and the internal surface of the fourth ventricle was covered with a glairy mucus. The *cerebellum*, the *tuber annulare*, and the *medulla oblongata*, were much softened. The brain was rather exsanguineous. The base of the skull had a ragged appearance. The eminences on the orbitar plates were sharp and prominent; and the transverse spinous processes of the sphenoid bone were very sharp.

Thorax.—Both lungs were very tubercular. The heart was comparatively small.

Abdomen.—The external surface of the intestines was rather pale, and the internal was covered with a slate-coloured mucus. There was no ulceration or thickening, but several ecchymosed patches were observed. The mucous coat of the stomach was covered with the same secretion. The liver was soft and easily torn, the gall-bladder was full of yellow bile.

From a perusal of the above cases, I think, it must be evident, that insanity is always connected with some morbid action going on in the brain, its membranes or the skull, producing eventually, in almost every case, some distinct lesion in one or other of those parts. But whilst I venture to express this opinion on the subject, I would also observe, that such lesions as have been described, when once induced, do in their turn become direct causes of insanity, from the interruption they give to the due performance of the function of the brain. It is therefore of primary importance to keep this in view in our treatment of the disease; for if our efforts are not directed at the outset, to prevent such changes from taking place, we will often find afterwards that our future attempts to cure the disease will prove unavailing.

In drawing up the foregoing cases, it will be seen, that I have not confined myself to a detail of the morbid appearances in the brain alone, but that those occurring in the different viscera of the thorax and abdomen have been minutely noticed, so as to give as extended a view as possible of the connection of the different organs with the brain.

Great caution is, however, necessary, as to the degree of importance to be attached to the influence these various morbid changes of the different viscera may have had in inducing or keeping up diseased action in the brain. Whilst I am inclined to consider the greater number of these changes as supervening upon the maniacal state, I am at the same time ready to allow that others may have been pre-existent or coëval with it. Aware of the great sympathy between the brain and the different abdominal viscera, it appears to me, that disease once called into action in the brain may not only be kept up by a morbid state of these parts, but that the primary link in the chain of causes producing insanity, often arises in one or other of these organs. A striking example in illustration of this exists in the case of a man at present in the Asylum, and labouring under deep melancholy. He was a patient of my friend Dr Hunter, and had been for years subject to violent attacks of gastrodynia. At first they were unaccompanied with mental irritation or anxiety. These symptoms, however, at length occurred along with a degree of incoherence and wild expression of countenance, which finally terminated in decided melancholy. And it is worthy of remark, that, from the period the melancholy supervened (upwards of two years) there has been no return of gastrodynia.

But whilst I mention this striking effect of a diseased state of the stomach inducing insanity, I would at the same time observe, that the supervention of an acute disease during the maniacal state often suspends the paroxysm, and occasionally completely removes it.

A patient some years ago in the course of a violent paroxysm of mania caught cold, which was accompanied with considerable fever. While labouring under this, a marked improvement took place in the state of his mind; and by the time he was rid of the cold, he was convalescent as to the mental disease. This patient got progressively well, and continues so.

A very interesting case, where the complete suspension of the maniacal state for a considerable period ensued, from an attack of acute disease, occurred in the Asylum lately. One of the patients caught typhous fever, and was in high delirium for about three weeks. As the fever abated, he was observed to answer questions and to express his feelings more rationally, and, by the time he was quite convalescent, his reason seemed to have been completely restored. He continued for two months in every respect quite well, when unfortunately symptoms of excitement again made their appearance.

But if the intervention of an acute disease during the maniacal state at times gives a check to it, the accession of a paroxysm of insanity on the other hand, often puts a stop to some other disease, under which the patient may chance to be labouring. A patient in the Asylum, who is liable to attacks of *bronchitis*, has, at different times, had this affection checked by a paroxysm of mania coming on, which has in its turn been cut short by an attack of *bronchitis*. The one alternately relieving the other.

In the treatment, therefore, of insanity, the state of the different viscera, both of the abdomen and thorax, will require to be particularly attended to.

An examination of the above cases will also show the close connection between palsy, apoplexy, epilepsy, and mania. The same morbid appearances in the brain are found in connection with each of these diseases, but how the one should be induced at one time and not the other, is not easy to explain. In apoplexy and epilepsy, the heart is often found diseased, and some of the cases now before us afford proof of the same organ being diseased in insanity. Diseases of the lungs appear to me to be frequently brought on during a paroxysm of insanity.

In offering these few general observations, it is not my intention to enter farther into the consideration of this subject at present,—my chief object in laying the above cases before the profession having been to present them with as accurate and detailed an account as possible of the various morbid appearances which had come under my observation in investigating the pathology of this most interesting disease.

Art. IX.—*Observations on the Mortality, from various Diseases, among His Majesty's Troops in India, confirmed by Tabular Statements and Returns, extending from* 1826 *to* 1832. In a letter to a Friend, from W. A. Burke, M. D. Inspector General of Hospitals, Bengal.

I have just seen in the last number of the Edinburgh Medical and Surgical Journal received here, viz. 113, for October 1832, a paper entitled Sketch of the Geographical Distribution of Diseases. In this, the prevalence of disease, with the ratio of sick, and loss by deaths and invaliding, among the troops in Bengal, are deduced, it is stated, from my return of the year 1826. But it is unjustifiable in the author to assume thus his data from *that* year; for in *it* the sickness and loss from deaths and invaliding were nearly double of what they were in subsequent years; and they were so principally from the wars in Ava, Arrakan, and in Upper India, at Bhurtpore; at the siege and assault of which fortress, hitherto deemed impregnable, very many were killed and wounded.

By chusing that year, 1826, therefore, as his criterion, the author has represented facts not in their true relation; and his reasoning is not based on just or correct data. It thus becomes a misrepresentation, and, what is of greater consideration, it may tend to wound the well-being of the medical department of the army; and I have, on that account especially, deemed it expedient to make out, and transmit to you herewith, abstracts of the returns of sick and loss by deaths and invaliding, from the year 1826 to 1832, both inclusive; which may serve for easy reference, and to disprove the correctness of the data given by the paper in the Journal, the author of which might, it is presumed, have had access to the general returns in the office of the Medical Department of the Army, where these documents are open, I believe, to the inspection, not only of every officer in the department, but of any gentleman in the profession, on applying to the Director General.

If truth and the general good of the service and of the *department* were the *real* objects in view, the result of the whole of the periods for which these were returns should have been given, rather than attempting to foist on the public that of 1826, the correctness of doing which is so easily impugned. That in 1826, the number of treated was 16,498; of deaths 774; and of invalids 379, is true.* But the number of sick, of deaths, and invalids, have since then borne no proportion to that year. The total number invalided for the last six years subsequent to 1826 is 366; being less by 19 than the number invalided in that year (1826), and that, too, when the average mean strength had been much greater than in the year 1826. The number of deaths for the last three years, on an average, is annually 387, being (by a curious coincidence) only just half of that of 1826. In the period of seven years, the proportion of deaths per cent. to the general mortality was, of fevers 26.8; of hepatitis, 7.3; of dysentery and other bowels complaints, 30.5; of pulmonic, 4.6, of which 1.9 were from *phthisis pulmonalis*, or as $\frac{1}{10}$th per cent. of mean strength; of cholera, 19.8.

These I have mentioned here as the great causes of mortality. Among the deaths from bowel complaints many had their livers diseased, and in some who had never complained of any particular affection of the liver while living, were found after death to have abscesses in that *viscus*. I have been some time employed on various subjects relating to all this, most important to the service, and hope to be able before long to produce a statement on their importance, and the effect they may have in the advancement of the profession, by the results of remedies in particular diseases, and their application under different circumstances, relations, and situations.

For the seven years, 1826 to 1832, inclusive, the proportion of loss by deaths is 5.7; the proportion of loss by invaliding 1.2;

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* It may be proper to observe, that the author of the article in question extracted Dr Burke's General Abstract of the Annual return of the Sick of His Majesty's Forces serving in the Presidency of Bengal for the year 1826 from the Appendix to Annesley's Researches on the Diseases of India. Had more comprehensive materials been available, he would not have failed to make use of them. Dr Burke's inference, that the author had sinister objects in view, is so absurd as not to deserve refutation. The author of that paper, however, has great pleasure in observing, that his deductions have given rise to so complete and valuable a return as that given by Dr Burke.—Ed.

total loss by deaths and invaliding, 6.9 per cent. per annum. Whereas the author of the Sketch in question says,—" *The same data warrant us in inferring that the annual loss by disease and disabilities is about* 14 *or* 15 *per cent. per annum;*" being *more than double* what it in *fact* has been for the seven years past.

Proportion of deaths per cent. of particular diseases among His Majesty's Troops employed in the Bengal Command, from 1826 to 1832, both inclusive.

1826.

		Treated.	Died.	Deaths per cent. to treated.	cent. to total strength.
	Fevers,	6786	234	3.4	2.9
	Hepatitis,	393	32	8.4	.4
Bowel Diseases.	Dysentery,	2399	228	9.5	2.8
	Diarrhœa,	1444	19	1.3	.2
	Pulmonic,*	531	21	4	.3
	Venereal,	1184	3	2	$\frac{1}{36}$
	Cholera,	370	160	43.2	2
	Ulcers,	606	4	7	$\frac{1}{20}$
	Rheumatism,	500	3	6	$\frac{1}{26}$
	Ophthalmia,	287			
	Other Diseas.	1998	70	3.5	9
		16,498	774	4.7	9.7

1827.

		Treated.	Died.	Deaths per cent. to treated.	cent. to total strength.
	Fevers,	4936	103	2.2	1.2
	Hepatitis,	497	34	6.8	.4
Bowel Complaints.	Dysentery,	2184	159	7.4	1.8
	Diarrhœa,	1006	18	1.8	.2
	Pulmonic,†	478	24	5	.3
	Venereal,	2338			
	Cholera,	452	129	28.5	1.5
	Ulcers,	628			
	Rheumatism,	540	1	2	$\frac{1}{87}$
	Ophthalmia,	425			
	Other Diseas.	3005	54	1.7	6
	Total,	16,439	522	3.2	6.

1828.

		Treated.	Died.	Deaths per cent. to treated.	cent. to total strength.
	Fevers,	4838	94	2	1
	Hepatitis,	505	35	7	4
Bowel Diseases.	Dysentery,	2047	170	8.3	1.9
	Diarrhœa,	890	12	1.4	1
	Pulmonic,‡	482	22	4.6	3

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* Of the pulmonic, six were *phthisis pulmonalis*, or one-half per cent. of total strength.—W. B.

† Of the pulmonic 12 were of *phthisis pulmonalis*, or 1-5th per cent. of total strength.

‡ Of the pulmonic 8 were cases of *phthisis pulmonalis*, or 1-10th of total strength.

	Venereal,	2559	5	2	$\frac{1}{18}$
	Cholera,	630	167	26.5	1.9
	Ulcers,	485			
	Rheumatism,	568			
	Ophthalmia,	630			
	Other Diseas.	3114	44	1.4	.5
	Total,	16,728	549	3.4	6.2
	1829.				
	Fevers,	5371	173	3.2	2
	Hepatitis,	588	57	9.7	.7
Bowel Diseases.	Dysentery,	1870	131	7.	1.5
	Diarrhœa,	660	6	.9	$\frac{1}{14}$
	Pulmonic,*	564	20	3.5	.2
	Venereal,	2853	6	2	$\frac{1}{14}$
	Cholera,	577	126	21.8	1.4
	Ulcers,	475			
	Rheumatism,	603	4	.6	$\frac{1}{21}$
	Ophthalmia,	616	1	.2	$\frac{1}{86}$
	Other Diseas.	2668	51	2.3	.6
	Total,	16,849	575	3.4	6.6
	1830.				
	Fevers,	4368	131	3	.4
	Hepatitis,	467	22	4.7	.2
Bowel Diseases.	Dysentery,	1558	96	6.2	1
	Diarrhœa,	565	2	4	$\frac{1}{30}$
	Pulmonic,†	439	20	4.5	.2
	Venereal,	1713	1		$\frac{1}{95}$
	Cholera,	190	41	21.5	.4
	Ulcers,	358	1	3	
	Rheumatism,	651	8	1.2	.1
	Ophthalmia,	530			
	Other Diseas.	3198	40	1.2	.4
	Total,	14,037	362	2.6	3.8
	1831.				
	Fevers,	3686	114	3.1	1.2
	Hepatitis,	411	39	9.5	.4
Bowel Complaints.	Dysentery,	1409	104	7.3	1
	Diarrhœa,	469	12	2.5	.1
	Pulmonic,‡	511	27	5 3	.3
	Venereal,	1882	2	.1	$\frac{1}{49}$
	Cholera,	297	50	17	.5
	Ulcers,	275	1	.3	$\frac{1}{99}$

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* Of the pulmonic nine were of *phthisis pulmonalis*, or one-tenth per cent. of total strength.

† Of the pulmonic fourteen were of *phthisis pulmonalis*, or one-fifth per cent. of total strength.—W. B.

‡ Of the pulmonic seven were of *phthisis pulmonalis*, or one-tenth per cent. of total strength.

		Treated.	Died.	Deaths per cent. to treated.	Deaths per cent. to total strength.
	Rheumatism,	548	10	1.8	.1
	Ophthalmia,	702			
	Other Diseas.	2563	34	1.3	.4
	Total,	12,753	393	3.1	4.3
		1832.			
	Fevers,	3425	79	2.3	1
	Hepatitis,	432	36	8.3	.5
Bowel Diseases.	Dysentery,	1083	95	8.8	
	Diarrhœa,	392	11	2.8	.1
	Pulmonic,*	584	28	4.8	.4
	Venereal,	1437	4	.3	$\frac{1}{10}$
	Cholera,	104	16	15.4	.2
	Ulcers,	271			
	Rheumatism,	546	6	1.1	.1
	Ophthalmia,	476			
	Other Diseas.	2537	36	1.4	.5
	Total,	11,287	311	2.7	4

Remarks on the following table.—The return for 1826 is rendered peculiar by the number of deaths from disease and wounds by the enemy, as also the invalided for wounds and disease in the wars in Ava, Arrakan, and at Bhurtpore, &c.

As to the number treated, and which exceeds the strength by 43.623, it is certain that the whole of the troops were not sick during the year, and, therefore, the number of admissions into hospital has been caused by the repeated readmissions of men who, from drunkenness or predisposition, &c. had relapsed, or been subject to other diseases. No men are dismissed hospital till perfectly recovered and fit for all duties.

Invalided and sent for England for change, &c. in

1826,	-	379	or	4.7 per cent.
1827,	-	113		1.3
1828,	-	112		1.3
1829,	-	55		.6
1830,	-	23		.2
1831,	-	23		.2
1832,	-	38		.5
Total,		743	or	1.2.

Proportion of loss by invaliding per cent.,	1.2	for the seven years.
do. do. by deaths, -	5.7	
Total loss by deaths and invaliding per cent.	6.9	

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* Of the pulmonic nine were of *phthisis pulmonalis*, or one-tenth per cent of total strength.

years inclusive.

Years, -	1826.		1827.		1828.		1829.		1830.		1831.		1832.		Seven years, from 1826 to 1832, both inclusive. Mean strength, 60,904.				
Strength, -	7976.		8761.		8910.		8680.		9520.		9095.		7956.						
Diseases.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Total treated	Total died.	Proportion of deaths to tot. strength per cent.	Proportion of deaths to treated per cent.	Proportion of deaths per cent of particular diseases to the gen. mortality.
Fevers, -	6786	234	4936	103	4838	94	5371	173	4368	131	3687	114	3425	79	33410	928	1.5	2.8	26.8
Hepatitis,	393	32	497	34	505	35	588	57	467	22	411	39	432	36	3293	255	.4	7.6	7.3
Dysentery,	2399	228	2134	159	2047	170	1870	131	1558	96	1409	104	1083	95	12500	983	1.4	7.8	28.2 } 30.5
Diarrhœa,	1444	19	1006	18	890	12	660	6	565	2	469	12	392	11	5426	80	.1	1 5	2.3 }
Pulmonic, *	531	21	478	24	482	22	564	20	439	20	511	27	584	28	3589	162	.3	4.8	4.6
Venereal, †	1184	3	2338		2559	5	2853	6	1713	1	1882	2	1437	4	13966	21		.1	.6
Cholera, -	370	160	452	129	630	167	577	126	190	41	297	60	104	16	2620	689	1.1	26.3	19.8
Ulcers, -	606	4	628		485		475		358	1	275	1	271		3018	6		.2	.2
Rheumatism, ‡	500	3	540	1	568		603	4	651	8	548	10	546	6	3956	32		.9	.9
Ophthalmia, §	287		425		630		616	1	530		702		476		3666	1			
Other diseases,	1998	70	3005	54	3114	44	2668	51	3198	40	2563	34	2537	36	19083	329	.5	1.7	9.5
Total, -	16498	774	16439	522	16728	549	16849	575	14037	362	12753	393	1 287	311	104527	3486	5.7	3.3	100.

* *Pulmonic.*—Of the 162 deaths under this head, (pulmonic,) 65 were from *phthisis pulmonalis*, being as 1-10th per cent. to main strength, and as 1.9 per cent. to general mortality.

† *Venereal.*—Of the 21 deaths under this head, (venereal,) 4 were of fevers; 2 dysentery; 1 cholera; and 1 *ulcus phagedenicum;* others in scrofulous and cachectic subjects.

‡ *Rheumatism.*—Of the 32 deaths under this head, (rheumatism,) 2 were of fevers; 3 hepatitis; 5 dysentery; 1 diarrhœa; 3 cholera: 1 apoplexy; 2 aneurism; 1 dropsy. In 2, metastasis to the brain took place; 1 ramollissement of the brain; 1 of exhaustion from large collections of purulent matter in different parts of his body. The 10 others were in long and protracted cases occurring in old soldiers, with great visceral disease, exhaustion, and debility.

§ *Ophthalmia.*—The fatal case under this head, (ophthalmia,) occurred from excessive intoxication.

ABSTRACT OF DEATHS from Diseases under the general term of Other Diseases.

	1826	1827	1828	1829	1830	1831	1832	Total
Phlegmon et abscessus,*				1	3			4
Phrenitis, - -		3	1	3	1			8
Cynanche tonsillaris, &c.		1					1	2
Bronchitis, - -							1	1
Carditis, - -		1	2	1				4
Peritonitis, - -							1	1
Gastritis, - -	1	1	2	1	1	1	3	10
Enteritis, - -	6	1	2	7	6	5	2	29
Splenitis, - -	3	5		1	4	4	2	19
Cystitis, - -			1					1
Variola, - -		1	2					3
Erysipelas, - -			1			1	1	3
Epistaxis, - -	1						1	2
Hæmorrhois,† - -					1			1
Apoplexia; *Coup de Soleil,*‡	29	21	21	18	4	6	4	103
Paralysis,§ - -		1		2	2	3		8
Dyspepsia,‖ - -		2	1		3			6
Epilepsia, - -		1		2	1		1	5
Tetanus, - -	2							2
Colica, - -			3	2				5
Hydrophobia, - -		1					2	3
Mania,¶ - -				1			1	2
Atrophia, - -							1	1
Anasarca, - -	8	3		1	3	3	1	19
Hydrothorax, -	1	1			2			4
Ascites, - -	1	3	3	3		2	3	15
Physconia, - -				1	1			2
Scrofula,** - -						1	1	2
Morbus coxarius, -	1							1
——— cordis, -		1						1
Icterus, - -			1	2	1			4
Contractura,†† -					1			1
Hernia humoralis,‡‡ -				1			2	3
Obstipatio, - -			1		1		1	3
Aneurisma, - -		1	1	1	2	1	1	7
Tumores alii, - -				1				1

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* Of these two died of psoas abscess, and one of abscess of the knee-joint.

† Died of anasarca.

‡ These were principally from excess in ardent spirits and exposure to the sun.

§ Of these three died of apoplexy, and one of *concussio cerebri.*

‖ Of these two were killed by falling from the roof of the hospital; one leaped off, and the other flung himself off, during a paroxysm of *delirium tremens.*

¶ Of these one died dropsical, and the other in consequence of sloughing in the sacrum and ham, with effusion in the head.

** Died of diarrhœa, with disease of mesenteric glands.

†† Admitted thus, but died of fever.

‡‡ Of these one died of diarrhœa, one of apoplexy, and the other of scirrhus.

	1826	1827	1828	1829	1830	1831	1832	Total
ernia,*					1		1	2
——— strangulata,	1							1
rolapsus ani,							1	1
istula in perinæo,	1							1
ubluxatio,	1							1
Vulnus sclopetorum,	12		1			1	1	15
——— incisum,				1		1	1	3
Contusio, or concussio cerebri,		2	1	1	2	1		7
Ambustio,	1	1						2
Fractura,†		2				4	1	7
Morsus serpentis,	1	1					1	3
Total,	70	54	44	51	40	34	36	329

Head-Quarters, Simla, 7th June 1833.

Art. X.—*Remarks on Relaxation and Descent of the Uterus and Bladder in the Puerperal State.* By John Roberton, Esq. Surgeon to the Manchester Lying-in-Hospital.

A degree of descent in certain of the pelvic viscera, from their natural situation, constituting disease, takes place more readily in the first few months, or I may rather say in the first few weeks, succeeding parturition than under other circumstances. In this most populous and industrious community, (Manchester,) lying-in-women of the poorer classes are soon up and doing for their families; many on the third day after labour, and the majority within the week. In consequence of this practice, numbers are obliged to apply at the hospital on account of what they denominate, "a bearing down," a term used to express in general, those sensations which arise from the uterus, bladder, or the vagina, becoming relaxed and falling lower than is natural. In the upper classes similar effects are apt to follow child-bearing in such as are too wilful to remain sufficiently long in a recumbent posture; and occasionally in those also, even where there has been no imprudence, whose labours are unusually severe and prolonged.

Writers are not well agreed regarding the predisposing causes of this accident in the puerperal state: some attributing it to the unusual weight of the *uterus* at this period, and the relaxed state of those folds and reflexions of the peritoneum, which bind the *uterus* and bladder to the pelvis, the rectum, the abdominal parietes, and to each other: while other writers join with these causes, relaxation of the vagina, and of the pelvic fascia especially.

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* One of these died of psoas abscess.

† Of cranium, and generally from accidents.

Before inquiring what are the *predisposing*, it may be well to notice the *immediate* causes. The following is a summary of the statements of twenty-five women suffering under different degrees of descent of one or more of the viscera referred to, as to what they considered to be the immediate causes of the complaint, (or the circumstances in which it appeared for the first time,) in their own persons. The statements are chiefly taken from a note-book, and include those of both private and hospital patients. Although some of the accounts are sufficiently explicit, others are less so than I could wish.

No. 1. A. D. *First* confinement: aware of the prolapse after going to her work in a factory at the end of the second week.

2. G. A. *Seventh* do. after rising from her bed on the third day.

3. G. F. *First* do. at the end of the third week after a very severe labour.

4. M. D. *First* Do. soon after labour.

5. A. C. *Fourth* Do. after leaving her bed on the fourth day.

6. S. D. *Seventh* Do. on leaving her bed.

7. M. D. *First* Do. was doing for her family on the third day.

8. A. R. *First* Do. after running hurriedly at the end of the month.

9. M. D. *Second* Do. after working vigorously at a pump.

10. G. S. *First* Do. soon after labour.

11. Mrs C. *First* Do. appeared when she began to walk about, at the end of a fortnight; labour tedious and severe, child, a male, and very large.

12. B. S. *First* Do. when weaning, after having suckled her infant 16 months.

13. M. F. *Fourth* Do. in the 5th week after labour.

14. E. M. *Second* Do. at the end of the 5th week; had exerted herself from the end of the fortnight.

15. F. M. *First* Do. was doing for the household on the 4th day.

16. A. B. *Second* Do. soon after labour.

17. E. G. *First* Do. first felt the complaint after attempting to lift a heavy weight during pregnancy.

18. F. H. *First* Do. appeared five weeks after labour in consequence of taking a long walk.

19. A. M. *Second* Do. appeared 5 months after labour, suckled till the 13th month, when prolapse was greatly aggravated.

20. C. L. *First* Do. soon after labour: contrary to the injunctions of her surgeon was sitting up on the third day.

21. B. W. *First* Do. on the 12th day after tedious labour requiring the forceps.

22. F. R. *Second* Do. soon after labour: was going about within the week.

23. T. W. *First* Do. on the fifth day after labour.

24. L. G. *First* Do. at the end of the first week after a tedious labour requiring the forceps.

25. A. B. *Second* Do. (a miscarriage.) Three months after this event became aware of prolapse.

It is well worthy of remark, that, of these twenty-five cases, in thirteen the complaint was thought to originate after a first labour. In another it was attributed by the patient to lifting a heavy weight sometime in the first pregnancy; and in a second, to long continued suckling of her first child. The great distension the vagina endures in giving passage to the head of the fœtus, for the first time, is productive of more temporary injury to that canal and the neighbouring textures than happens in a subsequent delivery; hence a condition of parts favouring the descent of the uterus and bladder, particularly should the patient be so imprudent as to leave her bed, and stand, or walk about too early.

The natural contrivances by which the *uterus* and bladder are held *in situ*, in health, are many and complex. Upon these *viscera* and the rectum, the peritoneum is spread, and firmly adheres to them. Passing from one viscus to another it is thence reflected on all sides, and attaches itself to the pelvis, with which it is closely connected as well as to the abdominal parietes. Thus in the unimpregnated and ordinary conditions of the parts, the peritoneum suspends the uterus and bladder, retaining them in their situations relative to each other and to the pelvis. The inclination of the pelvis, too, in the erect position of the body, assists in some degree in affording support. But probably the most important stay of these viscera during the puerperal period, when greater support is wanted, consists in the contractile texture of the vagina itself; and, more particularly, in the peculiarly firm attachment the vagina forms, at every part of its circumference, where it penetrates the strong, dense curtain which closes the outlet of the pelvis. A powerful muscle,—the *levator ani*, and strong fasciæ, compose the curtain; and it is through a slit in this texture that the *os externum vaginæ*, itself surrounded by a broad sphincter muscle and dense plexus of vessels, opens under the arch of the pubis. In dissecting the parts within the pelvis we find it easy to separate from its surrounding attachments all that portion of the *vagina* which is strictly intrapelvic; but on arriving where the vagina passes under the arch of the pubis, in other words, where it unites with the urethra above and with the rectum below, the strength of the connection is found to be very remarkable.

With the view of illustrating this point, I performed, in company with my friend Mr Boutflower, the following experiment. We had for our subject the recent body of a stout and vigorous woman who died after an illness of a couple of days. First, I cut the broad ligaments, continuing the incision in such a manner as to separate the uterus and bladder from their surrounding attachments to the pelvis. I then attempted to make the *os uteri* protrude at the *os externum vaginæ* by pressing forcibly on the fundus of the uterus, in a direction corresponding to the axis of the outlet: but I failed in my attempt, I could not push it so low. On examining into the cause of this resistance we found it to be situated where the vagina passes out of the pelvis, as I have before described.

The vagina, the curtain of the outlet, and the neighbouring textures, undergo considerable changes in the puerperal state; particularly, as has been already remarked, in a first confinement. The peritoneum covering the *uterus* itself, as also those reflections of it to the surrounding parts, after the great extension produced by pregnancy, is in the progress of shrinking; and being less dense and firm than at other times, is consequently little calculated to sustain the weight of the *viscera*. In dissecting the bodies of those who have died within a few days after delivery, I have noticed that the peritoneum on the *uterus*, where it is about to be reflected to the bladder, is loose and somewhat corrugated. The vagina on which the bladder, thus ill sustained by the peritoneum, rests its *fundus*, is relaxed and flabby; and, the same may be affirmed of the muscles and fascia which surround, and, under other circumstances, brace the vagina. Besides this, which is partly the relaxation naturally incident to parturition, and partly also, in many cases, the result of long-continued distension of the passage by the fœtal head, there is occasionally inflammation of the mucous membrane of the vagina, and leucorrhœal discharge, giving additional feebleness to that canal. These circumstances, when viewed in connection, (the somewhat greater weight of the uterus also being taken into account) prove how easily the bladder and uterus may suffer descent, should the patient leave the recumbent posture too early: and they further lead us to infer, that the moderately distended bladder, from want of due support, may, simply by its weight, drag down the *uterus* with it: and so become the chief cause of descent of that organ; an inference, the truth of which is frequently confirmed by experience.

The three following cases afford examples of slight *procidentia*, succeeding parturition, in first births, where proper remedies could scarcely at all be applied, owing to the poverty of the patients. The notes I possess of the cases, too, are but scanty. *That*, however, is of the less consequence, as I am not writing a regular treatise on prolapse of the uterus and bladder, but purpose merely to point out the great tendency there is in the puerperal state, and particularly after a first child, to descent of the pelvic viscera; and also to specify the simplest means of cure.

1. Ellen Fogg, aged 20, a month delivered of her first child, which, in consequence of severe and tedious labour, was stillborn. Ever since her confinement, she has been feeble, although naturally healthy. Five days ago first became aware that she had a bearing down, which she further described as a sense of weight, conjoined with a feeling as if something was about to protrude from the vagina. On causing her to kneel against a sofa I find the *os uteri* is little lower than natural, but the vagina is flabby, and in a degree prolapsed. Just within the *os externum*, under the arch of the pubis, the finger encounters a somewhat broad smooth tumour, easily pressed up. This fulness seems to be owing to the fundus of the bladder falling lower than natural, and carrying before it the upper wall of the relaxed vagina. The result of the case is not noted.

2. Martha Sullivan, aged 25, six months ago was confined of her first child. Admits that she was up and dressed on the third day; and that afterwards she daily rose and moved about as if she had been in health. Says that in about a fortnight after labour she was aware of something being amiss, having the feeling as if "her body came down."

On examining *per vaginam* I discover slight descent of the uterus, (the examination I may remark was made in the morning, and prolapsus in all its degrees is worse in the latter part of the day,) also great flabbiness of the vagina, and descent of the bladder; that is to say, a soft tumour occupies the upper part of the vagina just within the *os externum*, and is easily pressed up. Says that the sense of fulness in the part is greater when the urine is long retained. The above entry is dated the 1st of February. On the 25th of April, after having in the interval daily used the nitrate of silver lotion, (a scruple of the salt to eight ounces of water) and attended to the general health, this patient declares herself better.

3. Ann Mercer, aged 21, healthy-looking, a month and three days delivered of her first child. Applies on account of a bearing down. Suffered a great deal during her pregnancy from itching and inflammation of the vulva, for which she had medicine from the hospital. *Examination per vaginam.* Find the *os uteri* lower, in a slight degree, than it ought. But the cause of the sensation of bearing down is owing to descent

of the bladder, for I find a soft smooth tumour or fulness situated at the upper part of, and just within the *os externum*, under the arch of the pubis. Says she is obliged to work and cannot take rest. Ordered a Duffin's pessary, with the view that it may be taken out nightly, and the parts washed night and morning; and the nitrate of silver lotion to be injected. This entry is February 11. March 10: Cannot bear the presence of the pessary in the vagina. Tumour larger. Ordered to go into the country. May 7: Has just returned from the country, greatly improved in her general health, and in respect to the feeling of bearing down.

In the foregoing examples the patients were destitute, in a great measure, of the comforts of life, and more particularly of that ease and exemption from toil which admits of the uninterrupted employment of suitable remedies. The following cases, being more favourably circumstanced, were cured.

4. Mrs L. aged about 28, robust and vigorous. Confined of her second child. The nurse informed me that this lady ever since her first confinement (about two years ago,) has been severely afflicted with a bearing-down; which at times, even when she has been otherwise in good health, has disabled her from walking. It appears that, after her former confinement, being inexperienced and headstrong, she had, contrary to the advice of her surgeon, left her bed on the third day after labour, and in all respects had treated herself after the manner of an Indian squaw.

As I found from her own account that she had suffered much inconvenience, discomfort, and distress, until advancing pregnancy removed the complaint, she the more readily listened to my advice on the present occasion, which consisted solely in recommending *rest in a recumbent posture, as long as the sense of bearing-down should continue;* reminding her at the same time, that now was the opportunity for attempting a perfect cure, and that if she were again to leave her room, the complaint still existing, it was improbable she would ever get rid of it. For the first fortnight, my patient remained in bed lightly covered. At the end of that time a sofa, morning after morning, was brought parallel with the bed, to which she was removed for the day. At the end of five weeks of strict adherence to the recumbent plan, she began to sit and to use a little more liberty. On making inquiry many months afterwards, I found there had been no return of the complaint whatever.

5. Mrs W. aged 20, was delivered by means of the forceps after the head of the fœtus had remained 18 hours in the pelvis. It was her first labour, and not otherwise unpropitious than that it was severe and tedious. The child was feeble at first,

but lived. Considerable irritation of the bladder followed, requiring the employment of the catheter. There was also soreness of the vulva and vaginal passage, and, for the first week, slight feverishness. On the 12th day after labour, when sitting up by the bed, was aware for the first time of a feeling of bearing-down, which rendered it uncomfortable to remain upright. On examining *per vaginam*, I found the passage tender, flabby, and the uterus so low as almost to rest on the perineum. I now inculcated the necessity of perfect rest in the recumbent posture, lightly covered, on a mattress in bed; and occasional ablution of the parts with tepid water. The bowels were attended to. The labour happened on the 25th of July. By the 14th of August she had removed to a sofa. At this period she was suddenly seized with fever and ulcerated sore throat, which obliged her to keep her bed nearly a fortnight. On recovering from this seizure and venturing out of bed, she found the sensation of bearing-down entirely gone. By the 12th of September, although still weakly, she was free from all unpleasant symptoms, and soon, in every respect, perfectly recovered.

6. Mrs H., aged about 30, was delivered, in her first confinement, by means of the forceps, after the labour had continued twenty hours, and the head of the fœtus, notwithstanding severe uterine efforts, had remained at the outlet for eight hours. It was at the end of a week, when the patient began to leave her bed, that she first experienced a feeling of bearing down in the situation of the *uterus*. This was both urgent and distressing, unless she remained in the recumbent position. I was now informed by the nurse, that the patient had difficulty in voiding her water, and that she could only expel it by long-continued straining. I was therefore induced to examine *per vaginam*, when I found the *cervix uteri* resting nearly at the *os externum vaginæ*, and here, by its pressure on the neck of the bladder, impeding the function of that viscus. I directed her to raise the womb with her finger, when she had to void her urine. In this she partially succeeded; but on several occasions I was obliged not only to perform this office for her, but also to employ the catheter. The vagina was very tender and flabby. Soon afterwards, about the end of the fortnight, the patient was seized with an obscure and most severe affection of the head, (neuralgia, I believe,) which confined her to bed with little exception for six weeks. Long before the expiration of that period, all sense of bearing-down, as well as of difficulty in voiding the urine, had left her. Since her recovery, although she has been in the habit of walking considerable distances, she has had no return of the bearing-down.

The following case differs from those already reported, as it was the bladder alone which descended. It constitutes an example of that rare form of displacement known by the name of *hernia vesicæ*.

7. Mrs K. aged 23, of an active and healthful appearance, two months gone in her second pregnancy, tells me (October 31st, 1831) that four months ago she discovered, in the right labium, a tumour which was soft, and about the size of a small egg. At the period referred to, she was suckling her first child, then ten months old. Says that the tumour, which has somewhat increased in size, appears in a morning after she gets out of bed, and soon disappears when she lies down at night, also that its size is much lessened immediately after she has voided her urine.

On examining I detected a soft and slightly elastic tumour, occupying the middle of the right *labium*, on its inner or mucous surface. Pressure caused it nearly to disappear, and at the same time excited in her the desire to empty the bladder. With my finger I could readily trace the line of descent of the bladder (for the tumour was evidently produced by this viscus,) behind the wall of the vagina. This was not an instance of prolapse of the bladder, as commonly described. Here was *no mucous discharge*, or flabbiness of the vagina, or perceptible *procidentia uteri*. The bladder evidently passed in its descent to the right of the median line of the anterior wall of the vagina, and coursed behind the right wall, till it reached the edge of the labium of that side. It is remarkable that there were no very urgent symptoms, saving a rather frequent call to make water, with some degree of pain and sense of dragging in the back. In other respects the health was fair, and the patient occasionally walked several miles without much inconvenience.

After the reduction of the tumour, which was easily effected, I introduced on different occasions various sizes of the common globular pessary, and always for a time with relief; but sooner or later the bladder slipped past the pessary, and this was sure to be followed by such distress as required the immediate removal of the instrument. I now employed a sponge of moderate size, which was worn only in the day. This kept the bladder from descending into the labium, but when the sponge was removed I could feel that the bladder was not *in situ*. It had made for itself a nest pretty high up in the right side of the vagina.

Since the date of the foregoing report, Mrs K. has borne two children. By the employment of the sponge pessary, and perhaps also by the advance of pregnancy, the complaint gradually disappeared. On my attendance in the first labour, subsequent to the appearance of the tumour, I could discover nothing unusual in the vagina, although I made a careful examination. And now, after an additional interval of two years, she believes herself to be entirely free from the complaint.

The last case which I shall give is one of simple *prolapsus vesicæ.*

On the 25th November 1833, I was at a late hour in the evening requested by a professional friend to consult with him in a case of tedious labour, which had now continued between forty and fifty hours. The vagina, I was informed, was blocked up by a swelling situated on the pubal half of that canal, that is to say, immediately behind the arch of the pubis; and further, that, in the course of the day, the urine had been drawn off six times, followed on each occasion by, in a great measure, subsidence of the tumour. On making a manual examination, the finger came immediately on a large swelling situated, transversely, under and behind the arch of the pubis; fullest on the left side, caused, doubtless, by the position of the patient, who lay on her left side. Beyond this swelling, (which, when grasped by the fingers and thumb, poured a stream of urine from the meatus,) there was to be felt, first a deep sulcus, and then, further inward, the flabby lip of the nearly dilated *os uteri.* The catheter being introduced, a gill of urine was drawn, when the swelling almost disappeared. It was clear that the tumour was caused by descent of the bladder.

It is foreign to my present purpose to detail the nature, progress, and termination of the labour. Suffice it to say, we found the head firmly impacted in a contracted brim, a small fold of the funis (flabby and pulseless) in the vagina, and that the delivery was with some difficulty effected by means of the perforator and craniotomy forceps; but not till rupture of that part of the *cervix uteri,* which was jammed during labour between the fœtal head and the projecting promontory of the sacrum, had taken place. The rent was from two to three inches in length, and ran clear through the coats of the uterus. Severe constitutional disturbance followed, and the patient had to keep her bed for upwards of a month. By the end of the second month, though still weakly, she was beginning to do for her family. At this period, I made a careful examination *per vaginam,* with the view of ascertaining the situation of the bladder. I, however, could detect nothing unusual. The vagina was not flabby, nor was there any fulness behind the arch of the pubis to indicate that the bladder was lower than it ought to be. At this time (Feb. 20) the patient has no symptoms referable to the bladder. She is, in fact, saving a degree of debility, quite well.

I might easily multiply cases of a similar description, and I might also detail others of a different kind illustrative of the distressing effects which ultimately ensue when descent of the uterus or bladder in the puerperal state is neglected or mismanaged. For the present, however, I shall content myself with giving a series of brief practical deductions, all of them not perhaps fairly drawn from the foregoing cases; but at all events drawn from sufficiently ample experience.

1. Descent of one or more of the pelvic viscera is not, as is commonly believed, a disease chiefly of middle or advanced life. It is true, complete prolapse, the last miserable state of the disease,—is generally found in those who have passed their 35th or 40th year; but the first stage of descent ordinarily commences early in the child-bearing period of life.

2. In a majority (perhaps I might say in a great majority) of instances, the complaint follows a first labour; and that from causes which have already been stated.

3. When first labours are tedious, more especially when this appears to be owing, in any measure, to the great size of the child, it behoves us to be on our guard against the occurrence of the disease during the puerperal period, that is during *the first six weeks.*

4. The complaint is curable if detected on its first occurrence, as also when the proper plan of treatment is adopted in the puerperal period immediately following *that* in which the complaint first appeared. But if the disease is neglected, each succeeding labour renders it less remediable. And further, when it has once manifested itself in the puerperal state, even although it may have seemed to be cured, we are bound, on every recurrence of that state, to subject the patient to certain precautionary restrictions.

5. *Rest* in the recumbent posture, which must be perfect and uninterrupted, is the most powerful, indeed the chief means of cure; of course every other measure that prudence can suggest being meanwhile pursued to invigorate the general health.

6. Astringent lotions and pessaries of every description are, in puerperal " descent," either injurious or wholly inefficient. The only lotion that ought to be employed is tepid water.

7. Those who are habitually subject to even the slightest visitings of this complaint ought never to suckle a longer period than five or six months; since prolonged lactation, next to frequent child-bearing, tends the most powerfully to produce a condition of the vagina favouring " descent."

Art. XI.—*Case of Deficient Vagina.* By J. Edwards, Esq. Surgeon, Forfar. *Preceded by Observations on Deficiency or Absence of the Vagina.* By the Editor.

The receipt of the communication of Mr Edwards has suggested the propriety of adverting to the few instances of this form of defective structure on record, in order to present, at a single view, all the known facts.

It may be proper to premise, that when the outlet of the generative or vector canal in the human race is impervious, this may arise from one of two causes.

The first is obliteration of the cavity of the *vagina*, produced by mutual adhesion of its walls. Of this there may be two forms, imperfect obliteration *(atresia vaginæ imperfecta)* and complete obliteration *(atresia vaginæ perfecta.)*

It may happen that these changes are congenital. But they are much more frequently the result of a species of gangrenous or sloughy inflammation of the *labia* and *vagina* incident to infants, in the course of which the vaginal mucous membrane is completely mortified and detached as a slough, while, if the powers of life be not extinguished completely, granulation and adhesive inflammation of the raw surface afterwards take place, and produce adhesion and consequent obliteration or *atresia*, more or less perfect.

This disease of the junction of the cutaneous and genital mucous surface was first well observed by Percival, more recently by Mr Kinder Wood, and some foreign authors; and its effects have been well distinguished by Sandifort, Osiander, and Mr Howship. We mention it here, that it may not be confounded with the genuine want of *vagina*.

Deficient *vagina* is a very rare circumstance. Meyer mentions, in the miscellaneous writings of Schmucker, a case of this kind, in which a portion of perforated cellular membrane passed from the peritoneum, and filled up the empty space. The ovaries were reasonably natural; the *labia*, with the *clitoris*, very small; and the *nymphæ* were entirely wanting.*

A similar instance of deficient *vagina* is given by Oberteufer in Stark's New Archives of Midwifery, volume ii., number 4.

The best example, however, of this anomaly in structure perhaps yet recorded, is given by Mr Howship in his Practical Observations on Surgery and morbid Anatomy. From the account given by this author, it appears that the original preparation is preserved in Mr Heaviside's museum; and it further appears that the case had occurred to Mr Perkins, surgeon to the Bristol Infirmary.

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* Schmucker, Vermischte Schriften B. ii. S. 290.

The case is very distinctly described by Mr Howship in the following manner.

"November 25, 1765, a girl about sixteen was admitted into the Bristol Infirmary, who, for twelve months before, had been subject to violent pains in her bowels and back, which frequently occasioned the strongest convulsions, and oftentimes nearly deprived her of reason.

"She had, during her illness, employed several of the faculty, who never gave her the least relief; on the contrary, she was much worse, for as she had never any appearance of the catamenia, and none suspected any preternatural conformation, about the uterus or vagina, the strongest emmenagogues usually given in menstrual obstructions were exhibited.

"On examination, it appeared that there was no vagina, for on introducing one finger by the rectum, and another by the *meatus urinarius*, (which was of so uncommon a size as to admit of it with little or no distension,) nothing was found to intervene but the proper coats of each, connected by the cellular membrane. The uncommon dilatation of the urethra was attributed to her mother's forcibly intrôducing her finger, as she imagined, into the vagina, when she laboured under a violent paroxysm; the outer extremity of the meatus was jagged, turgid, and bled freely, from the smallest violence consequent to introducing the finger.

"When the finger was in the anus, the uterus was plainly felt, and seemed as if by some cause pushed low down. In size, it was considerably enlarged, equal to a pregnant uterus far advanced; it might easily, during the pains, be felt as high as the navel, where, as well as from within the rectum, its vessels felt very turgid, and as if disposed to burst.

"After many fruitless attempts to discover the *os tincæ*, it was evident it was nowhere to be found. In this emergency, an immediate puncture into the uterus was judged expedient. Accordingly, the external parts being held aside by an assistant, a finger was introduced into the rectum, and a trocar was then cautiously directed, so as to wound neither rectum nor urethra, into the uterus, and immediately discharged nearly two pounds of menstrual blood, after which the orifice was considerably enlarged, and a large armed tent introduced into the new passage to the uterus.

"From the time of the operation, which was performed on November 30, she continued gradually to mend, and on January 6, 1766, she had her menstrual flux in proper quantity, without any inconvenience. The discharge of pus from the wound gradually decreased, and by the end of the following month, she had entirely recovered her health, and had no subsequent return of her fits, or other complaints."[*]

In this case by Mr Howship, it is impossible to doubt that the *vagina* was really wanting; for between the *urethra* and the *rectum* nothing was found but the cellular tissue common to both.

In the following case by Mr Edwards, though the actual absence of this canal is not quite so clearly established, and it might be doubted whether the canal was not simply obliterated, the case is important, as adding another to the facts on the organic causes of *amenorrhœa*.

E. Machar, aged 32, and married, having, during fifteen years, suffered from bad health, had been treated by different medical men for retention of the menstrual discharge. Previous to November 8th, when I found her complaining of severe paroxysms of pain resembling regular labour-pains, she would allow no examination to be made. To this proposal, however, she now acceded.

I then discovered the *vagina* to be wanting. A *clitoris* smaller than natural, with some appearance of *nymphæ* could be observed: and on pressing upon the usual situation of the canal a slight depression could be made.

The patient being placed in the lithotomy position, and a catheter introduced into the urethra, an incision about an inch in length was made over the usual situation of the canal, and upon dissecting cautiously through about an inch of dense fibrous substance, I could then feel a tumour similar to the head of a child, pressing downwards, into which I introduced the knife, which was followed by the forcible discharge of six pounds of menstrual fluid. The wound was stuffed with lint.

A slight sanguineous-like discharge attended the removal of the dressings, during a few days succeeding the operation, which terminating in serous fluid at length disappeared. To obviate contraction, a bougie was introduced, and retained for some time.

The patient rapidly recovered without any bad symptom, has menstruated twice since the operation, and is at present enjoying comparatively good health. In this case there did not seem to me to be any natural vagina. The fore-finger can be introduced about three inches; but whether it enters the *uterus* or not, I am, however, unable to determine. The *mammæ* are unusually small, and sexual appetite is deficient.

Her husband after remaining with her six months left her.

February 4, 1834.

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[*] Practical Observations on Surgery and Morbid Anatomy, illustrated by Cases, &c. By John Howship, Member of the R.C. Surg. Lond. Lond. 1816, p. 351.

PART II.

CRITICAL ANALYSIS.

Art. I.—1. *Etudes Anatomiques, Physiologiques et Pathologiques de l'Oeuf Dans l'Espece Humaine, &c.—Investigations, Anatomical, Physiological, and Pathological, on the Ovum, &c. &c.* By **Gilbert Breschet**, M. D., &c. With six Plates. Paris, 1832. 4to. Pp. 144.

2. *Embryologie ou Ovologie Humaine, &c.—Human Embryology or Ovology, containing the Descriptive and Iconographic History of the Human Ovum.* By **Alphonso A. L. M. Velpeau**, Professor of Anatomy, &c. With fifteen Plates. Paris, 1833. Folio. Pp. 104.

We proceed to resume the examination of the second part of the work of M. Velpeau, that, namely, which is devoted to the examination of the developement and progressive growth of the fœtus and its parts.

The narrative of facts and details on this subject the author introduces by reminding the reader, that the period at which the *ovulum* appears in the womb is still enveloped in the thickest obscurity; and that, notwithstanding the investigations of twenty centuries, no one has yet been able to penetrate or unravel this mysterious question. After a rapid glance at the successive doctrines of Hippocrates, Haller, Maupertuis, and Buffon, he remarks, that the inference of Haller and most of his pupils, that the embryo is not visible till after the fifteenth or the twentieth day, had been generally received as the most likely among physiologists, till its accuracy came to be questioned by the publication of the pointed and remarkable fact of Sir Everard Home in the Philosophical Transactions of 1817.

This consisted, it is well known, in the observation of a lacerated *ovarium* with effusion of blood, and the lining of the inner surface of the womb, with a plastic or albuminous exudation, in the middle of which was recognized near the neck a minute, oval, body, which both Sir Everard Home and M. Bauer regarded as an *ovum* detached from the lacerated ovary and impregnated.

Notwithstanding the circumstantial manner in which the details of this case are given by Sir Everard Home, M. Velpeau questions not only the accuracy of the observers, but the justice of the conclusions which they have deduced. He doubts, in the *first* place, whether the girl in question was impregnated; then, admitting impregnation, he questions whether this process had taken place on the day on which she had gone out of her master's house; and he doubts whether the *ovulum* is in the womb on the seventh day. He further urges the objection, that the germ of the human female is neither like a grain of barley nor oval in shape, but that it is spherical; and he doubts whether the minute body which was regarded by Home and Bauer as a germ, or impregnated *ovum*, was really entitled to that character. He concludes, in short, that the fact observed by Home has no scientific value.

It appears to us that, though in every physiological inquiry it is indispensable to observe the most scrupulous care in the admission of facts, and the greatest accuracy in the deduction of inferences, yet in these objections M. Velpeau evinces a degree of frivolous nicety and fastidiousness which, at least, is not warranted by the nature of the case. If objections of this description are to be admitted as valid, there is, in short, an end of all reasoning founded upon observation and testimony. We shall afterwards see whether M. Velpeau adduces evidence sufficient to demonstrate the validity of those objections.

From the fact, established by the observations of Prevost and Dumas, that a period of three days elapses in the rabbit, and from six to seven or eight in the bitch, between the animation of the germ and its arrival in the womb; M. Velpeau observes that, at the lowest computation, the latter space must be requisite in the human species.

He afterwards proceeds to overturn, in the same manner, the representations of Meckel, Beclard, Adelon, Boivin, and Chaussier, upon the size, appearance, and shape of the germ, as all equally destitute of foundation.

In order to rectify the mistakes prevalent on this subject, M. Velpeau details shortly two cases upon which he thinks no doubt can be thrown. In the first, which came under his own observation, a midwife, who had followed his instructions, was at the last day of the menstrual secretion when her husband returned from Rouen, where he had spent six weeks. Connection took place the following day, and on the thirteenth day thereafter the female, who was already the mother of six children, had an abortion. The *ovulum*, which she immediately sent to M. Velpeau, might, strictly speaking, be less, but could not be more, than ten days detached from the ovary; and in this case, which, to the knowledge of the author, is the only one in which the age could be positively ascertained, the embryo, as well as the *vesiculæ*, and all the membranes, were distinct. The umbilical chord, even, was already in existence, and the shape of the minute embryal body could not be mistaken. The bulk of this *ovulum*, with that of two others, which were, in like manner, under twelve days, did not exceed that of a large pea.

In the second case, which is given by M. E. Weber, in his Dissertation, a young female, who was known to be pregnant eight days, died of poisoning; and, upon inspection, he found he could distinguish, between the inner surface of the *uterus* and the *decidua*, a rounded, villous, bladder, containing an embryo. It is remarkable that, though the present author has not described with sufficient precision the anatomical relations of the parts, yet he thinks that he can prove, that the objects found by Home in the womb of the servant girl, had no connection with healthy generation, and that the last anatomist has mistaken a flake of albuminous mucus for a fecundated *ovum*.

Now, notwithstanding the laudable attempts to obtain precise results on this point by M. Velpeau, it appears to us that the period of the descent of the *ovum* cannot be determined with perfect exactness, and that in different females it may vary within a few hours, or even a few days. In some females, its detachment and descent may be accelerated, and in others they may be retarded beyond the normal time.

After these preliminary observations, M. Velpeau undertakes to give a general account of the primitive form of the human embryo at the earliest period. According to this observer, in an embryo at the twelfth day, it is so difficult to distinguish the different parts, and the slightest pressure so easily disfigures, that it is impossible to define with accuracy the shape. In that already mentioned, the germ, which was bent in the shape of a crescent, appeared to him to differ from the embryos a little more advanced only by the smaller size of its cephalic extremity, and by the less elongation of its coccygeal extremity. In the figure it is not dissimilar in shape to that of the human kidney, with the two extremities, however, more remarkably incurvated, and, consequently, forming a more concave sinuosity, from which is seen issuing a narrow process connecting it to the membranes, and which is manifestly the umbilical chord.

Before the end of the third week the human embryo acquires a striking resemblance to the embryo of serpents, excepting in proportional length. It represents, then, an incurvated stalk, forming almost a complete circle, from two to three lines in diameter, and, if rendered straight, at least from four to five long, and similar to one of the animalcules delineated by Prevost and Dumas, especially the animalcules of the dog. Of its two extremities, one is generally but irregularly swelled and rounded; the other, terminating in a point, has led to the belief of the original existence of a tail in the human race. Hollow and semitransparent, this body appears to be filled with a limpid fluid, in the midst of which may be observed, even by the naked eye, an opaque, white, or yellowish thread, which represents the cerebro-spinal system.

From many observations collected on very young embryos, M. Velpeau draws the following inferences. 1*st*. That the spine is the fundamental part of the body, appears before all the other organs, and exists alone for a considerable time. 2*d*. That its shape does not differ essentially from that which it presents at the other periods of intra-uterine life. 3*d*. That, till beyond the twentieth day, the embryo is neither straight in direction, nor swelled in the middle. 4*th*. That the head and neck form at least the half of the length. 5*th*. That its incurvation approaches that of a circle so much more closely, as it is less fully developed. And 6*th*, That the appearances of its external or convex circumference differ very little from those which it subsequently presents; while its anterior or concave surface is important, by reason of its presenting all those changes which take place in the progress of devolopement.

Upon this concave surface, indeed, all the organs appear successively; at first the different parts of the face, then the extremities, and, between these, the thoracic and abdominal viscera. Nothing is so wonderful as this process of developement, which resembles a genuine vegetation or budding growth. The lower jaw, the extremities, and a large mass, which is to occupy the belly and the chest, grow and extend forwards, exactly in the manner of buds which issue from the branch of a tree, or the *axilla* of a plant. The circle which M. Velpeau denominates rachidial is in this manner completed. As the head is separated from the *coccyx*, the thoracic and abdominal portions of the primitive stem are thus compelled to assume the straight direction. The head continues inclined, indeed, upon the chest, but in such a way, nevertheless, that the chin eventually assumes the position occupied by the forehead. The *coccyx* is thrown backwards only at a very late period,—a process which is the effect of the developement of the *pelvis* and pelvic extremities, which impels it in this direction by a very simple species of mechanism.

On this subject, though we are not favoured with the general results of the inquiries of M. Breschet, we may, however, attempt from his figures and their descriptive explanations to collect some useful statements.

In the figures of embryos given by this author in Plate IV.

the embryos are less strongly incurvated, and are more elongated, with the cephalic extremity large and rounded, and the coccygeal in the shape of a minute inflected tapering process.

Observing the lateral and anterior portions of the body appear long after the vertebral stem, M. Velpeau was more than once led to believe with Messrs Tiedeman and Meckel, Serres and Geoffroy Saint-Hilaire, that the organic evolution takes place from the sides towards the median line, or, to say with M. Richerand, that the embryo is at first a mere groove, the margins of which, budding from behind forwards, come to be united on the anterior median line by a species of suture; but this hypothesis attentive and repeated observation has compelled him to relinquish. The median line, indeed, of the face and neck never presents a vacuity, nor did he ever find the thoracic organs entirely uncovered. If the mass from which these organs appear to be formed seems to be covered only by a very fine web, as to the belly, the *parietes* of the chest present their natural appearances not less obviously as soon as they can be distinguished.

M. Velpeau has found the embryo, however, to vary in figure, with the head very small, the belly very large, others forming a transparent bladder, terminating in a slender process, and, indeed, all the figures mentioned or delineated by authors. But the whole of these he regards as anomalies or deviations from the healthy state; and, consistently enough, he infers that the small embryo represented by Soemmering, Lobstein, Maygrier, Pockels, and Breschet are referable to this head.

We have now, after these observations on the general growth of the embryo, to attend to the successive developement of its different parts, as delineated by M. Velpeau.

I.—*The Head and the Organs of Sensation.*

§ 1. The *Head* forms at first a sort of elongated appendage. Its growth is then continued with that of its relation to the rest of the spine; but the appearance of the belly and the chest seems quickly to deprive it of part of its enormous volume. As neither the face nor chest exist at this period, the primitive embryo is void of neck. At the period of five weeks, the face is very distinct from the *cranium*, and the head, separated from the trunk, no longer presents the appearance of a simple pyriform swelling. The cranial portion shows then in the bladder which it forms the disposition of the brain. The facial portion is already quite opaque.

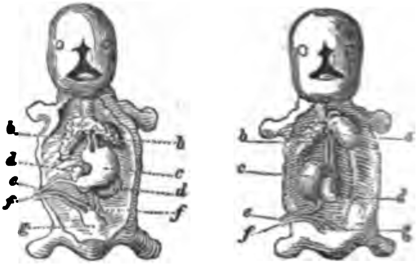
§ 2. *The Mouth* is the first organ of the senses perceptible, and M. Velpeau perceived it in the youngest embryo observed; consequently it exists from the twelfth to the twentieth day, and forms then an extremely large elliptical or triangular opening.

The upper jaw being very prominent, while the lower is very short, causes the mouth of the human embryo to resemble that of the embryo of the snake.

Anatomists have never varied upon the idea which they have conceived of the manner in which the lower lip is formed. All have thought that it was originally composed of two lateral portions, which were afterwards united upon the median line, like the two bones upon which it is supported. But with the upper lip it is not the same. So long as it was believed that the upper jaw contained only two bones, it appeared rational to represent the corresponding lip as consisting of two pieces only. Since the admission of an intermaxillary bone, it is generally agreed, that the upper lip is developed in three portions; a median pillar, and two lateral portions, which uniting give origin to the two naso-labial sutures or crests. It is by the aid of this theory that modern authors explain the formation of simple or double hare-lip, which, according to them, ought never to be observed on the median line. Refining still upon these divisions, already too multiplied, it has been recently maintained, that the upper lip is developed in four separate points. Velpeau affirms positively, that these latter ideas must have arisen only from inattention or insufficient observation. During the period under consideration, the inferior lip begins to be distinguishable. The chin thrusts forward its middle part, but its thin free margin is not interrupted by a fissure, and constitutes a very regular semicircle. The upper lip also is longer than the lower, and presents a deeper curvature. Finally, upon embryos of six weeks, as upon others which were only from fifteen to twenty days, M. Velpeau found the margin of the two lips perfectly formed and without division, and when the contrary was the case, of which he had numerous examples, he could easily perceive that it had resulted from an alteration either pathological or mechanical.

§ 3. *The Nose.*—It is inaccurate to say that the organ of smell can be recognized only towards the sixth or eighth week. At the thirtieth day, it is often possible to recognize its anterior apertures to be round, situate immediately above the mouth, directed forwards, and resembling two little black specks. The nasal prominence, however, and the naso-palatine vault, are equally unformed at this period. It must be observed, nevertheless, that in various embryos of from five to seven weeks, the nasal apertures are not yet very evident, whilst a distinct eminence already occupies their situation.

In the figures of embryos of the first three weeks given by M. Breschet, a tolerably distinct view of the state of the nose, mouth, and lips, is communicated. The nose and mouth appear in those in the form of a large double lozenge-shaped slit or aperture, formed as it were by two lozenges united by their angles, the superior being the smallest of the two. The small or upper lozenge is the rudiment of the nasal cavity; while the large or inferior is that of the mouth. Examined at a later period of developement, it is found that the superior lozenge-shaped aperture is filled by the descent of the nose from its superior angle, with the central column of the upper lip, which remaining still ununited with the lateral masses, leaves the fissure or slit on each side.



It must not be concealed, nevertheless, that several of these figures of the fourth and sixth plates of M. Breschet appear to be taken from embryos which M. Velpeau would probably regard as imperfect in the result of diseased action.

§ 4. *The Eyes.*—The organ of vision appears at the same time as the mouth, if not earlier. M. Velpeau recognized the orbits in embryos, the length of which did not exceed four lines. They are always found, at least, in the course of the fourth week, when a wonderful simplicity regarding what is afterwards to ensue is observed. Void of eyelids, ocular angles, lachrymal apparatus, like a mere circular disk, half a line in diameter, and slightly convex, the bulb of the eye is separated from the surface of the body only by a narrow superficial groove, which can be perceived only by searching for it with the point of a needle. It consists merely of two specks,—one yellowish-white in the centre, the other dark,—in the shape of a circle, enclosing the former on the one side, and continuous on the other with the integuments. The yellowish central spot is at first much larger than the blackish ring which surrounds it; but, in general, the latter predominates in size towards the end of the sixth week. The whole unquestionably represents the sclerotic and transparent *cornea*, which, still completely opaque, seems to differ from the tissue of the nails only in colour. It might be denominated, in truth, a portion of skin and *epidermis*, modified to suit the exigencies of the organism. Instead of being directed forwards at this period, the eyes are forcibly turned towards the side, as in most quadrupeds. As the orbitar arches and the root of the nose are not yet apparent, they are neither separated nor surrounded by any prominence.

§ 5. *The Ears.*—The ear is cognizable at the latest in thirty days, and undergoes no remarkable change till the sixth or seventh week. It appears at first in the shape of the orifice of a cutaneous follicle, or a superficial, narrow, pyramidal depression. Some days afterwards, it might be mistaken at first sight for a leech-bite, with this difference, that, instead of three angles, it presents four. There is no trace or rudiment of external ear. The auditory aperture is on a level with the skin. Like the eye the organ of hearing appears to be only a modification of part of the integuments. From five to six weeks, the re-entrant angles of this crucial or rhomboidal depression begin to rise above the level of the skin. First appears the *tragus*, then the *antitragus*, then the *helix*. All these parts spring by a species of eccentric vegetation, and remain some time before inclining towards the head, or being contorted upon each other.

II.—*Of the Members and the Lower Part of the Trunk.*

§ 1. M. Velpeau has been unable to ascertain whether the thoracic or the pectoral extremities appear first in the process of developement. Whenever he could distinguish the appendages of the chest, those of the *pelvis* were equally visible. Nor have the respective dimensions of these parts presented the great disproportion stated by authors. At first they are separated by a small interval, the former short from the anterior point of the lateral ribbons of the rachidial stem, nearly at an equal distance from the *vertex* of the head, and the tip of the *coccyx*, supposing the embryo straight; while the latter are observed about one line above the *coccyx*, which is incurvated forwards, and as it were concealed between them.

Previous to the developement of the organs of the belly and chest, the members are less near the concave, than the convex surface of the rachidial stem; but their roots seem to be carried backwards as developement advances from the fourth week.

The hand appears first in the form of a sort of hollow cup, the free margin of which is thin and scarcely divided. From this the foot does not differ sensibly. Both parts have a surface slightly concave, directed towards the median line. More or less inclined to each other, their margins are chiefly directed forwards.

Between the thirtieth and the fortieth day, the fore-arm and the leg are cognizable, and the tips of the fingers begin to be distinguished. At the forty-fifth or fiftieth day, the cubit and the arm begin to be detached from the chest, to which they have previously the appearance of being united by means of a membrane. The heel and knee also now present a distinct existence. The thigh, however, like the arm, is very short, evidently because it is still imperfectly detached from the sides of the abdomen. All the toes are very distinct; and the gelatinous layer which unites their base now ceases to extend to their inguinal extremity. The foot no longer resembles the hand; the toes are differently arranged from the fingers; and, in short, these two orders of organs assume nearly the form which they present at the period of birth. It is even then so evident that the one order is destined for station, and the other for the prehension of objects, that the absurdity of the dogma, that man is a quadruped, is even then manifest.

In the figures of M. Breschet the germs or buds of the thoracic and pelvic extremities, appear in the character of minute tubercles, or amorphous processes sprouting from the trunk in embryos of about eighteen days or three weeks; and in this state they continue till the end of the fourth week or thirtieth day. At this early period, however, the lungs (*b*) are recognized in the shape of granular masses; the heart (*a*) is observed on the left side, and on a level with the left thoracic tubercle, like a minute grain, but when magnified affecting the shape of the adult heart; the stomach (*c*) like an oblong bladder, with the long diameter corresponding to that of the body, and terminating in a narrow tube (*e*) going with the vessels to the umbilicus; and in the pelvis the bladder (*g*) sending up to the same point the *urachus* and another tube.—(See figures in p. 412.)

These figures illustrate the mode in which the intestinal tube and the urinary mucous membranes are developed from the *vesicula umbilicalis*.

§ 2. *The Coccyx and the Generative Organs.*—The preceding account shows, that, during the first three weeks, the trunk terminates below in a vermiform extremity; and that species of tail considerably incurvated forwards acquires insensibly a straight direction, in proportion as its mucous cavity is filled. M. Velpeau even thinks it may be said, that its margins become continuous with the abdominal mass, or are concealed by the organs of the pelvic members. The space between this part, the insertion of the umbilical chord and the feet,—which, indeed, does not exceed a line or a line and a-half in extent at the fifth and sixth weeks,—remains long in the character of an excavation, which is gradually filled by the sprouting of the genito-urinary organs; and this is at length completed by the developement or concentric elongation of the abdominal *parietes*, and the margins of the *coccyx* and *sacrum*.

About the fortieth or forty-fifth day, a black point anterior to the coccyx indicates the situation of the *anus*. A little nearer the navel, a conical tubercle, traversed by a groove along its inferior surface, constitutes the rudiment of the clitoris, or of the penis, according to the sex. A fissure, variable in breadth and depth, extends from the former to the latter part, and in some embryos this space is smooth. But in this space it is impossible to recognize other sexual organs, so that no external mark characterises the sexes at this period. As there are neither *labia* nor *scrotum*, and the infra-pubal production is the same in all,

M. Velpeau observes that it is not unnatural to suppose all embryos to be of the male sex.

§ 3. The *Navel* appears, properly speaking, to have no existence till the thirtieth or fortieth day. The chord is simply lost amidst the visceral mass of the abdomen. The abdominal walls, however, speedily concur to its formation, by extending from above downwards, from the sides towards the anterior median line, and, in short, by converging towards the omphalo-placental stem.

M. Velpeau properly observes, that the instances of eventrations, of entrovertion of the bladder, which are not unfrequently observed at birth, depend either on the circumstance, that the concentric progression is not completed, or, what is more common, that the abdominal wall is broken or dissolved a short time before having been formed. He states that he has met with three instances in which this is unquestionable. It may be admitted, indeed, that the instances of monstrous or deformed fœtuses with the abdominal *viscera* exposed or protruded without the *parietes*, or, in other words, of defective formation of the abdominal parietes, are at once proofs of this mode of developement, and results of the process being interrupted or perverted, or deranged at that early period of contra-uterine life, at which the formation is only in progress.

III.—*The Embryo considered between the sixth and the seventh week.*

After the sixth week, or the sixtieth day, the organism of the embryo proceeds rapidly to completion. The eyes become more convex, and are soon surrounded by a distinct palpebral *areola*, which inclines in their circumference, and the two extremities of the vertical diameter of which gradually approaching each other, speedily gave it the elliptical shape, thus forming the two ocular angles. At the ninth or tenth week, or later, the free margins of the eyelids mutually touch, and are so agglutinated in some subjects, that several observers have believed them to be adherent. Previous to coming into mutual contact, they are thin and sharp, yet their thickness exceeds that of the eyelid itself. Though these curtains completely cover the anterior part of the eye, their semitransparence readily permits its colour to be distinguished. It is then evident that the black spot already mentioned, which is now yellow and large, constitutes the *cornea*, and that its posterior surface is in contact with a substance of the same colour; and that the blackish areolar ring, equally enlarged, is the sclerotic, and that its colour depends on the layer by which it is lined.

The *Nose* especially undergoes remarkable changes. Rising gradually, the prominence which it forms, above the lip, causes its anterior apex to be inclined insensibly downwards. Its inferior, which forms part of the facial cavity to the fifth week, begins to be separated in the course of the sixth.

The *Mouth* undergoes no essential change. Its depth increases, and the tongue becomes broader and thinner. The lower jaw becoming more prominent, renders the anterior hollow of the neck more manifest. The lips are more distinct and more completely parted; but their configuration is the same.

The *External Ear*, resembling in the embryo of from four to five weeks the appearance of a leech-bite, quickly acquires peculiar characters. All the parts of its *Helix* are unfolded. Next to the *Tragus* and *Antitragus* appears the fissure of the *Helix*, with which it is continuous; and the *Antihelix* itself becomes visible at the seventieth day. Though all these objects are formed behind the auditory canal, the ear, nevertheless, appears to advance forwards during this period, and to approach closer to the angles of the mouth and of the eyes.

The *Members* speedily arrive at the shape of their complete condition. At the eighth or ninth week, all the fingers are isolated, or, in other words, are no longer united to each other except by a gelatinous transparent layer. The three phalanges even may be already distinguished,—tending to be inflected on the palm of the hand. The dorsal surface of the last phalanx presents a spot or patch, which must be considered as the rudiment of the nail. Opaque lines indicate the position to be occupied by the metacarpal bones. In the proportional length of the arm and thigh relatively to that of the fore-arm and leg, there is nothing extraordinary. The rudiment of the shoulder and of the hip can no longer be mistaken.

The *Coccygeal Tip* is more completely concealed by the pelvic members, and less prominent than fifteen days later. The *anus* ceases to present the appearance of a blackish depression. At the sixtieth day, it forms a small conical projection of a yellow colour, more or less deep, and hitherto without perforation. The genital tubercle continues to be elongated; while its base is surrounded by a very thick prominent ring. At some distance from its free extremity arises a circular furrow, which corresponds to the *corona glandis*. The groove of its inferior surface is entirely closed in many embryos; while in others it appears in the form of a fissure to within a line of the anal depression.

The developement of the perineum, of the pelvis, and of the hypogastric region, causes the umbilical chord, which in the first period appears to be inserted between the origins of the pelvic extremities near the coccyx, to be removed considerably from these parts, and to approach the centre of the abdominal protuberance. The circle of the *umbilicus* is at length united so intimately with the stem, by which it is traversed, and on which it is continued, that there is no longer any line of demarcation between the integuments of the one and the membranous sheath of the other. If at this period, as at birth, the bulk of the belly appears enormous, it must be ascribed partly to the circumstance, that the organs contained within the *pelvis*, on the one hand, and in the chest, on the other, have not yet attained their full developement.

From the foregoing sketch it results, M. Velpeau infers, that the figure of the embryo is perfectly drawn at the thirtieth day at the latest; that at this date all the parts visible externally are recognized without difficulty; and that, ultimately, we have only to observe the gradual developement of each.

ART. II.—*Hints on the Constitution of Dispensaries, with the view of their being rendered of more extensive benefit to the labouring population, &c.* By JOHN STORER, M. D. F. R. S., M. R. S. L., Consulting Physician to the General Hospital near Nottingham. London, 1832. 8vo, Pp. 92.

AT a time when the principles of civic economy, and the right government of all associations and institutions, intended for the public good, engage general attention, and are brought to the tests of utility and equity, it is earnestly to be hoped, that the important subject of the administration of medical charities will not be overlooked Even although the Parliamentary Committee, appointed to inquire into the present state of medical polity, now sitting, should not consider it as coming within the limits of their appointed duties, to investigate the operations and tendencies of these institutions, the subject ought not to be neglected either by the public, or by the profession. The evils of the existing systems are obvious. To remedy them may be found difficult. But, just as a perfect knowledge of the disease is an essential preliminary to its satisfactory treatment, so is it of the first importance, that we acquaint ourselves thoroughly, with all the indications of unsoundness, that manifest themselves in the workings of our schemes of benevolence.

It has long been a prevailing opinion amongst medical practitioners in this country, that, by the profusion of gratuitous aid extended to the community through our numerous hospitals and dispensaries, great injury has been done both to the profession, and to many objects of its bounty. To the former it has caused incalculable detriment, which no other profession would have endured, by leading the public to estimate its services at a rate ruinously low, and by establishing a system, which, if not speedily checked, may be the means, ere long, of bringing the greater part of the population of the country into the situation of pauper-patients. To the latter—namely, to the poor themselves—the serious injury has been done, of lessening their sense of independence, and encouraging them to think lightly of the first steps which lead down to the degraded state of pauperism. And it is a very painful reflection, that the benevolent exertions, and well-meant liberality of our forefathers should have been instrumental, in the least degree, in diminishing the strength of that high moral principle, once a distinguishing feature in the character of our poor, which led them to scorn the idea of becoming, in any way, dependent on charitable aid.

But, although such sentiments have prevailed in the profession for many years, utterance has seldom been given to them, for the plain reason, that very few could avouch them, without subjecting themselves to the imputation of being influenced by selfish views. It is, therefore, gratifying to see one, whose age, character, and professional rank, place him above all suspicion of being actuated by motives of self-interest, coming forward with a direct avowal of the views above stated, and entering the lists as the champion of the long neglected rights of the profession, as well as of the true principles, on which alone charitable institutions ought to be conducted.

Dr Storer, the respectable author of the book now before us, after having practised in Nottingham for fifty years, has "relinquished all professional pursuits to his junior brethren." In publishing his sentiments on this subject, he has acted so independently, as to have it in his power to declare that his tract "was sent to the press without the privacy of one individual of the medical profession." The opinions therein stated are, therefore, we conceive, entitled to serious consideration. They are given, it is true, with reference only to one department of medical charity; but the principles laid down are equally applicable to others. We do not propose to enter upon either a criticism or an analysis of this tract, but in the course of a few general observations which we shall offer on the subjects to which it refers, we shall take the liberty of quoting a few illustrative sentences from its pages.

To be satisfied that some change is necessary in the mode of conducting our medical charities,—(because, *first*, the poor are demoralized by the present system; and, *secondly*, because the interests of the profession are injured by it;) we have only on the one hand, to look at the numbers of persons admitted to participation in their benefits, whose circumstances ought to render them independent of eleemosynary aid; and, on the other, at the consequences of such a state of things.

I. With regard to the first point, we are not prepared to state what actual proportion the improper, bear to the proper, objects of public bounty, but we confidently appeal to the experience of all medical men, who have been engaged in the service of public charities, for corroboration of what we now give as the result of our own observation,—namely, that the number of unnecessary admissions to hospitals and dispensaries is sufficiently great to indicate the existence of serious evil; not, certainly, to show that the present arrangements for the distribution of medical charity are radically bad; but, unquestionably, to point out the necessity of strict inquiry, preparatory to judicious reform. It cannot be denied, for instance, that some who are in the receipt of good wages,—who have comfortable homes,—kind and attentive relations,—and who are, even, the possessors of considerable funds in savings banks,—seeing that, by obtaining admission to an hospital, they can secure to themselves (although, perhaps, their complaints may be trivial,) the regular attendance of men of the highest standing and greatest experience in their profession, without incurring the least expense, do not hesitate to take advantage of the opportunity; and, without being conscious of the disgrace attachable to dependence on the charity of others, obtain, but too easily, recommendations for admission, from their wealthy neighbours, and enter an hospital. Others, again, who, by a little personal exertion, or by application to their relations for assistance, might have procured the means of support, as well as medical aid, without becoming inmates of an hospital, are led to neglect these attempts to preserve personal independence, and, allured by the easy terms on which a comfortable bed and kind nursing can be obtained, cast themselves on the public care. Not a few are detected in attempts to feign disease, in order that they too may enjoy the advantages of temporary residence in an hospital; and it is to be feared that instances of successful impositions are by no means rare.

Again, amongst those who apply for gratuitous aid at dispensaries, how many are there who do so, not because they are in poverty, but because they choose to go to the cheapest market! It is notorious in all large towns where dispensaries are established, that recommendations are given without sufficient inquiry into the circumstances of the applicants. It is evident that the labouring class is becoming less and less scrupulous about entering these institutions. They find themselves there carefully attended to, and skilfully treated; they place confidence in the medical officers, and by degrees, they begin to regard access to the dispensary as a kind of heritable right, or as a perquisite of their station, although they may have money enough and to spare, wherewith to purchase the benefits they receive. We once met, in a public conveyance, a man, who, for several years, had held a comfortable office in the custom-house at London, and who, when we saw him, was on his way to enter upon a situation of responsibility and considerable emolument in the country, who did not hesitate to mention to some of his fellow-travellers, (all of whom were gentlemen,) that he had shortly before applied to the physicians of a certain metropolitan dispensary on account of some serious ailments; and, finding that he was in the company of medical men, he went so far as to produce his prescription paper, with the name and regulations of the dispensary printed on one side, to satisfy us as to the means by which he had been restored to health. He seemed to be perfectly free from feelings of shame on account of his having received charitable aid. It may not be unnecessary to add, that he was a shrewd and intelligent man, and a native of this side of the Tweed. If such entire want of the feeling of degradation, which ought, certainly, to be connected in every honourable mind with an application for eleemosynary aid, were so strongly exemplified in a case such as the above, it is to be feared that the public have already too extensively begun to regard dispensaries in the light of common goods; and, probably, not a few imagine that, by merely presenting themselves at such an institution, they confer as great a benefit on the physician, as he can possibly confer upon them.

On this subject, Dr Storer makes the following remarks, " Dispensaries, as they have been usually constituted in this country, and viewed as merely charitable institutions, are liable to the great objection of offering, without the possibility of due discrimination, to the labouring population generally, gratuitous aid in illness, which is unquestionably due to many, under circumstances that render them fit and very deserving objects of it. In doing this, the difficulty is to restrain the boon that is proposed to its just bounds, and to avoid the error, and the serious evil to society, of bringing whole families into the class of receiving assistance from a charitable institution, who have hitherto maintained their independence. It is true, and it is a very gratifying truth, that there is still a class of the labouring population, who set a high value on their independence, and these are not found among the applicants to the dispensary; but it is equally true, that there are not a few sensualists, who are much more attached to personal indulgence, than to the care and credit of their families; and who are always ready to accept, and to claim, charitable aid, in any form, to enable them to make a greater reserve for private gratification."

II. In the second place, let us consider what are the evil consequences resulting from this superfluous professional charity. It appears to us very clear, that they are, 1. a degradation of the moral sense of the poor; and 2. a lowering of the value of medical aid in the estimation of the public.

First, we think that the moral sense of the poor is degraded. This result seems to be brought about nearly according to the following process. When a person, whose circumstances ought to render him independent of charitable aid, is once made a pauper-patient, he, very naturally, becomes flattered with the hope that, as often as he may require it in future, he will obtain the like privilege on the same easy terms. Hence, on returning to his wonted employment, he finds one motive to industry altogether removed,—his spirit of independence is broken,—and, having become reconciled to the condition of a pauper in one particular, he loses all disinclination to enter upon the degraded state of entire dependence on public bounty. He gradually becomes idle; then intemperate; then thoroughly diseased; and, reduced to the extremity of want and wretchedness, nothing is left for him but to apply for parochial relief. We are not prepared to cite many positive instances of effects, such as we have above alluded to, having actually been produced on patients receiving gratuitous medical aid. It is, doubtless, difficult in the present state of society, to ascertain to which kind of public charity the poor owe their demoralization in the greatest degree; and, perhaps, it is impossible to determine this point in particular cases; further, we are ready to admit that certain good effects may be wrought in the moral feelings of the objects of medical charity, which may go far to counteract the evil influence, which, in other respects, as at present administered, it tends to produce.

Not the least of these good effects are, *first*, the raising of their ideas of personal comfort, by the temporary experience which is afforded them of the advantages resulting from cleanliness, order, good bedding, and temperance; and, *secondly*, the excitement of gratitude for the unremitting attentions bestowed on them, and for the comfortable circumstances in which they find themselves placed by the generosity of the rich. This last feeling, doubtless, forms a very strong bond of society, and whatever tends to increase its strength, cannot be too highly prized. But, with all these admissions, we yet hold it to be distinctly evident, that the general tendency of the profuse liberality with which the doors of hospitals and dispensaries are thrown open to the labouring-classes, is to weaken in their minds that important feeling of personal independence, upon which so much of the strength and well-being of society depends. We cannot be too deeply impressed with a sense of the value of this principle. Wherever it is prevalent amongst the labouring-class, there, in a special manner, is that class found distinguished by sobriety, obedience to the laws, and the steady practice of all the moral virtues; and wherever it is awanting, there it is that wretchedness and vice reign with desolating sway.

Secondly, We affirm, that a lowering of the value of medical aid in the estimation of the public is an almost inevitable consequence of indiscriminate professional charity. And we think it requires slight consideration to satisfy every rational observer that the public, seeing so much work done gratuitously, is very likely to draw the conclusion that the services of medical men are but of small value, and that those who so zealously devote themselves to labours of charity cannot but be sufficiently recompensed by trifling fees from patients able to pay. In the relief of all improper objects of professional charity, the interests of their generous, but imprudent benefactors, suffer the double loss of whatever sums they might have afforded in remuneration of the services rendered at present, and of such other sums, as, if their moral principles had not been destroyed by an officious and unnecessary manifestation of liberality, they might have contributed on future occasions. But, if it were really so, some may ask, why have we heard no complaints hitherto from the profession on the subject? It cannot, surely, be so blind as not to perceive what is injurious to its own interests. Dr Storer very properly remarks, that the reason why no complaint nor remonstrance has been made is, that the feelings of the profession lead it to decline bringing private interests into competition with any object of public benevolence. Perhaps there is prevalent in the profession the same spirit as that which animated Fothergill, who declared, that he "wished most fervently to do the business that occurred, with all the diligence he could as a *present duty*, and to repress every rising idea of its consequences." Indeed, there are many reasons why medical men are silent on this subject, and some of these forbid that we should enter into further details regarding it. We shall therefore only further remark, that the absence of complaint is not a decisive proof of all being satisfied.

Such are the views and facts which lead us to conclude, that an extensive and minute inquiry is necessary with reference to this subject. But there exist in England other arrangements for the distribution of medical charity, to which we have not adverted, because we have not had opportunities of examining their operations for ourselves; but which, from the representations of others, we have no hesitation in characterizing as still more baneful than those we have just referred to. We now allude, more particularly, to the farming of the parish poor; a system, which, we believe, will be found, on examination by competent authorities, to be productive of most serious injury both to the profession and to the poor, and to furnish very cogent reasons for an efficient reform. Perhaps, also, many of the engagements entered into by medical practitioners with sick clubs, and benefit societies, for attendance on their members, are open to the same condemnation; although the system, under proper regulations, might work well.

The first step that ought to be taken towards remedying the evils which we have endeavoured to point out, it appears to us, should be, the instituting of an extensive inquiry into the present state of medical charities throughout the united kingdom. This might be undertaken either by the Parliamentary Committee now sitting, or by a body of delegates from the leading medical corporations. The results of such an inquiry having been made public, the profession at large would be furnished with correct data on which to form opinions as to the definite measures of reform that ought to be adopted. It would be premature to propose particular plans for the better regulation of medical charities before some positive and authentic information, such as might be collected by an authorized committee of inquiry, shall have been made public. It is required to direct our thoughts into proper channels. But we may be allowed to refer to a few points which we think especially deserving of consideration.

1. Would it not be possible so to change the constitution, mode of support, and internal economy of hospitals, as that admission to them should be a matter of right to all who might contribute towards their upholding, and submit to their rules? The existence of hospitals seems to be so necessary to the comfort and well-being of every civilized community, for the reception of cases requiring nice operations, and peculiar treatment, and of patients affected with contagious diseases,—as well as for the sake of medical education,—that it will probably be found they cannot be dispensed with. We cordially assent to the truth and importance of the principle laid down by several distinguished political economists, and, in particular, by Dr Chalmers, that legal charities, and public charitable institutions of almost all kinds, are injurious to the commonwealth; but we would carry this principle even farther than most of its advocates have done, and we would say, that hospitals on the present system for the reception of the diseased poor generally are evils nearly as great as the English poor laws themselves. Dr Chalmers excepts all "infirmaries, dispensaries, and asylums, whether for the cure of mental and bodily disease, or for the keeping of that which is incurable"* from the sweeping con-

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* Political Economy, p. 410.

demnation in which he involves all other modes of administering relief to the indigent in a public manner. Others, again, think that asylums for the deaf and dumb—the blind—and those who have met with sudden accidents, are the only Institutions of this kind which do not do more harm than good.

But, although we coincide in principle with the last mentioned writers, we cannot consent to the entire abolition of common hospitals. Our view of the matter is, that they ought to be so supported and conducted as to be as little liable to the imputation of being charitable institutions as is a police establishment,—a gas-light-company,—or any similar device for the public good. We would place them beyond the pale of charity. We would have no eleemosynary hospitals. Let matters be so arranged as to admit of a majority of the labouring-class obtaining *a right* to avail themselves of the benefit of a public sick-house. Such an arrangement formed part of Sir Thomas More's ideal scheme of the polity of a perfect commonwealth; and, perhaps, it may still be regarded by many as Utopian; but we do not despair of seeing it generally adopted even in our day. At least, we do not see that it is opposed by any insurmountable obstacles.

It would, probably, be found necessary that the legislature should at first establish, and, subsequently, regulate and protect, these free hospitals. Their number might be proportioned to the population on the results deduced from medical statistics. There ought to be some for the reception of ordinary cases,—others for contagious diseases,—a third class for incurables,—and a fourth for accidents and surgical cases. They might be supported by a general compulsory assessment, sufficiently large to provide every desirable accommodation, and to furnish liberal salaries to the medical officers. It would probably be found that the sum, required from each individual assessed for the hospitals, would be so small as that it might be in the power even of persons receiving very moderate wages to pay it. In consideration of this sum, duly paid to, and certified by, the proper public collectors, the payer might obtain a right to admission into the hospital when sick, under such regulations, of course, as might be required to prevent imposition. If the number of medical attendants were to be fairly proportioned to the number of sick placed under their care, and if their salaries were made liberal, no injury would be done to the interests of the profession. It may be said that the smallness of the sum exacted by the assessment which would entitle to the benefit of the hospital, might have the effect of depreciating in the eyes of the patients the value of medical attendance at home. But this would be counteracted by the knowledge, which all would have, that the medical officers were amply remunerated for their services, and they would be led to see in a striking point of view the advantages of co-operation, when they reflected that, by their small payments, they had actually acquired a just right to so many privileges. But when the moral sense of the people shall have been again raised by the removal of present causes of degradation, and by extension of the benefits of Christian education, it may be fairly concluded, that most would rather remain at home, that they might enjoy the endearing attentions of wife and children, and would pay adequate fees to the medical men of their own choice; looking upon the hospital, not as a place of resort in ordinary cases of sickness, but only as a valuable receptacle for them under particular circumstances.

It is highly improbable, indeed, that any considerable number of persons in a respectable community will ever be disposed to forego the comforts of home during sickness, for the sake of entering an hospital, however well conducted. Besides, the circumstance of the hospital being used as a medical and surgical school would be likely to prevent many from resorting to it. So that, although every individual paying the assessment might have a right to admission, this right would, in very many instances, never be exercised. Except in particular cases, it might be found expedient not to admit any persons who do not contribute to the support of the hospital: and, when such are admitted, it ought to be made distinctly apparent that they are indebted for the privilege solely to the generosity of private friends who pay for them.

2. And what, it may be asked, should then be done for the poorest, who cannot pay any assessment, however low? It appears to us that we cannot do better for them than revert to the customs of former times, when medical men, acting independently, and according to their own discretion, gave them attendance and medicine in the way of private charity. The days of true benevolence in this matter have almost passed away; but we see no reason why we should despair of their being restored. And is it probable that the profession should ever be found able and willing to take upon itself the whole charge of that vast and costly machinery of dispensaries, wherewith the profuse, but imprudent, liberality of modern times has sought to administer to the supposed necessities of the poor?—We think it is.—But, until the labouring-class shall have recovered, in some measure, from the serious injury which has been inflicted upon them by the injudicious administration of the poor-laws, —and until the tone of their moral feeling shall have been raised, and their habits of dependence on others for what they ought to have provided for themselves broken in upon, we must admit, it is to be feared, that the burden will prove a heavy one, and

that there will be many unreasonable demands made on the liberality of individuals. This inconvenience, however, we may confidently anticipate, will be only temporary. For, as the effect of public charity has evidently been to widen and extend the territory of human wretchedness, it is to be expected, that when it ceases to operate, that territory will be gradually reduced to its former limits, presenting a manageable field for the exercise of private benevolence.

The remuneration received by medical men from the public in the shape of fees ought to be sufficiently liberal to enable them to devote part of their time and substance to deeds of pure charity, according to their own discretion; and how much more satisfactory would this be to their feelings than becoming the servants of public institutions, and so resigning, to a great extent, their independence in a matter which ought to be connected with the highest sentiments of our nature. It is far from being agreeable to have one's charitable works blazoned forth to the public, as incentives to it to supply more and more money for purposes that ought to be accomplished by the profession itself. Whether the public or the profession be chargeable with the political sin of introducing the present arrangements, it is evident, that the profession is now paying the penalty of its imprudence in connecting itself with them, in the shape of a vast increase of gratuitous labour; while the public suffers from the evils necessarily attendant on a gradual demoralization of those who ought to be the very sinews of the state. For, before dispensaries or parish-surgeoncies existed, when medical practitioners were much less numerous than they now are, we do not learn that the poor were neglected, or that physicians of those days found themselves overwhelmed with the work of charity. On the contrary, do we not find it recorded of many, even of the most distinguished members of the profession, that they devoted a certain portion of their time regularly to visiting the poor? Is it not matter of history that the Sydenhams, the Radcliffes, the Meads, the Fothergills, of a former age, gave of their substance as well as of their time to the miserable? Such men, and such times, we hope to see again, when professional benevolence shall be allowed to flow in its own legitimate channels.

3. It is reasonable to admit that these views must be subject to modification according to the results of the general inquiry, which, it is proposed, should be the first step taken towards a reform in medical charities. It may be found advisable to form municipal or parochial establishments, on an uniform plan, throughout the kingdom, for supplying the poor with medical aid. And, already, there exist in different places various sys-

tems which might serve as models for such institutions; or, at least, from the working of which, many useful hints for the formation of one general plan might be gleaned. We allude, particularly, to the very economical system followed in Glasgow, where several respectable practitioners undertake to attend the poor gratuitously, (each having a small district allotted to him,) and receive medicines for distribution, according to their own discretion, at the expense of the town. We also refer to the so-called "self-supporting dispensaries," proposed by Mr Yeatman, of Garston, (Somerset) in 1818,—founded and promoted by Mr Smith of Southam, (Warwick,) and ably advocated by Dr Storer in the pamphlet now before us. There are now about twenty of these institutions in England, and wherever they have been established, they have been found instrumental in reviving the spirit of independence in the lower orders, and in promoting a diminution in the parish-rates. They are supported, partly by voluntary contributions from the wealthy, and partly by a penny a-week collection from all persons of the labouring-class, willing to pay it, whose wages exceed ten, but are under twenty, shillings a-week. Those who pay this sum, the "free members" as they are called, have the privilege of choosing their own medical attendants from amongst those who are attached to the institution, and of receiving from them advice, as they require it, without further charge. The fund raised by the contributions of the rich goes for a supply of medicines, while the penny a-week fund is divided amongst the medical men, in proportions corresponding to the number of patients each may attend.

"The obvious advantage," says Dr Storer, "which is gained by a free subscriber to such an institution is, that, without forfeiting his independence, and the respectability attached to it, he secures to himself and his family medical advice, regular attendance at his own habitation, when necessary, and medicines of the best quality, at a much less expense than would be otherwise within his reach; as the terms are so adjusted as to give the free subscriber a fair advantage beyond what would be attainable in private medical practice; by this measure, he also obtains as much security as can be given, against one of the greatest and most frequent misfortunes liable to happen to an industrious family; that of being brought into a state of poverty, by the lengthened illness of any one of its members."—("Hints," p. 31.) The unequivocal testimony of several highly respectable individuals has been given in favour of self-supporting dispensaries; especially, we may refer to that borne by Dr Arrowsmith of Coventry, (Lond. Med. Gazette, Vol. xii. p. 426.) and by Mr Jones of Derby. (Ib. p. 355.)

A scheme for a modification of these institutions, which was published in the London Medical Gazette of 23d February 1833, is, perhaps, also worthy of notice. A dispensary has recently been founded on its principles at Lynn, which is said already to have wrought well; and another, on a plan nearly similar, has been in operation at Sheffield for several years past. It appears to us that, supposing the very poor to be cast wholly upon the care and sympathy of medical practitioners, some such plan as that just referred to might be adopted with great advantage both to the public and the profession, for the sake of those of the labouring-class who cannot afford to remunerate their medical attendants in a regular manner. Its peculiarity consists in establishing a kind of deposit-bank, whence, upon payment of fixed sums, tickets are issued, entitling the bearers to attendance and medicine from any of the practitioners who agree to connect themselves with the institution, to whom the patients may choose to apply. The tickets being given to the medical men on their being called to the patient, the funds are divided annually amongst them, according to the number of tickets each may hold.

But, that such institutions may be fixed on a fair and equitable basis, there are certain principles, which, according to our view of the matter, medical practitioners must agree in supporting, and in acting upon.

The *first* is, that the medical profession requires, for the satisfactory and complete performance of its functions, a larger proportion of the public fund than is necessary merely for its comfortable maintenance. This arises from the expense of books, instruments, and other means of keeping up and increasing its knowledge; and from the necessity, which is so generally felt, of providing the means of rapid locomotion;—not to speak of the political expediency of according to the labourer, in whom great trust is reposed, proportionally large wages. For, as Adam Smith has justly remarked, "*health* is intrusted to the physician; fortune, and sometimes life and reputation, to the lawyer and attorney. Such confidence could not safely be reposed in people of a very mean or low condition. Their reward must be such, therefore, as may give them that rank in the society which so important a trust requires. The long time and the great expense which must be laid out in their education, when combined with this circumstance, necessarily enhance still further the price of their labour."—(Wealth of Nations, i. 160.)

We may be allowed to remark that, whatever weight the argument in favour of the justice of remunerating medical men liberally, founded on the expense of their education, may have possessed in the days of Dr Smith, it is augmented threefold in the present day. For, not only has the time prescribed for professional study been considerably lengthened, but the number of the branches of science, which must be attended to, has been increased. It may now, with truth, be asserted, that, of all the learned professions, that of medicine and surgery consumes the largest proportion of the time and pecuniary means of its candidates.

Secondly,—no medical practitioner ought to be forced to take charge of a greater number of patients than he is able to attend to in a satisfactory manner, without encroaching on the time which ought to be devoted to study and to repose. The consequences of a neglect of this principle are—the ruin of the health of the practitioner, and improper treatment of the cases under his care. Such a state of things must, and does, not unfrequently, occur; and it will continue to do so, until the public opens its eyes to perceive the justice of the principle which it now violates.

Thirdly,—the legitimate gains of the profession ought to be made on six days of the week; the seventh being consecrated exclusively to "works of necessity and mercy."

Guided by these principles, and aided by the data furnished by the science of medical statistics, it will be found no difficult matter to arrange the details of institutions, such as we have alluded to above, so that they should not interfere with the just rights of the profession, and yet prove a great accommodation to the public.

Were hospitals supported by assessment, and deposit-banks for collecting and distributing the small payments of the labouring-class established on a proper basis, the work of true medical charity might, we think, as has been already stated, be safely left to the individual actings of benevolence in the profession. It may be some time ere the moral feelings of the poor shall be so far improved, as to lead them to co-operate energetically with us in attempts to throw off the burden of existing evils, which presses equally on all classes. But we do not despair of seeing that day arrive when, what is now accomplished with difficulty, through the agency of a cumbrous apparatus, supported at great expense, and; apparently, injuring the morals, although it relieves the pains, of those on whom it acts, will be easily, quietly, and effectually done, through the spontaneous and unfettered effusions of professional liberality, without the risk being run of inflicting serious injury on society.

Fourthly,—it is evident, however, that, on this subject, there is as great room for diversity of opinion as there is with regard to the expediency of a compulsory provision for the daily support of the poor. And, as it is so firmly maintained by many, that a system of poor-laws is essential to the comfortable existence of a population such as that of this country is at the present day, so do we anticipate, many will conclude, that establishments, national, parochial, or municipal, for dispensing medical charity to the poor, are equally necessary to the well-being of society. If this should prove to be the deliberate opinion, formed on sufficient grounds, of a majority of those qualified to judge in the matter, and if a medical establishment shall really be formed for the benefit of the poor, it is to be hoped that the interests of the profession will not be overlooked by the legislative authorities, even although, from motives of delicacy, its members should not come forward publicly to defend them. If medical charity should be legalized, the agents employed in its distribution must not be expected to labour gratuitously. On this point, we cannot do better than quote the words of Dr Storer.

" In all cases involving the interests of society, and where the community are the gainers, a compensation at the general expense is justly due to all who undertake permanent and responsible duties, and is as much a matter of good policy as of justice. Upon no other rule or principle could the affairs of society be conducted. Accordingly, it has become a maxim, established by universal practice, from the first ministers of the crown down to the lowest servant of the public."—" In saying this, we are far from being disposed to overlook, much less to undervalue, the disinterested conduct of some distinguished individuals in all professions, who are ready to devote their time and services to advance the best interests of society. These form honourable exceptions, but can never be brought forward as a rule, in dealing with a body of men. There are certain principles, common to all classes, involving the very essence of justice, and to which all have an equal and indisputable claim. It is true that the members of the medical profession do not appear hitherto to have preferred this claim for themselves ; their case has been viewed with indifference, and the treatment they have received has been an exception from that experienced by all other classes or ranks in society ; indeed, the relation of this profession to society in general, has hitherto been a complete anomaly, compared with the principles that have been observed towards all other orders. It is time that the justice of the public should be appealed to ; and such an appeal, as far as it is founded in justice, will never be ultimately made in vain. When duly considered, its reasonableness will be admitted ; and the question will be settled finally on a footing more satisfactory to the public, as well as to the profession." " It cannot be supposed, that the practice established hitherto is to be ascribed to any perversion of the principles of equity in the minds of the community. It seems more reasonable to suppose, that it has had its rise in the forwardness of medical persons themselves, to make an offer of unconditional services in all cases of a benevolent or charitable nature, where they could be found desirable or useful."—" When the institution of a dispensary is in contemplation, numerous offers of gratuitous assistance are usually made. The appointment to a public trust is flattering, and is often the first object of a young man's laudable ambition. The consequence is, that in a populous town more offers are made than are wanted. The candidates are numerous, and the young men are brought into the lists of competition with others of a like standing. It is evident that some must succeed, and others fail; and each is so anxious to obtain that mark of public preference, that he is prepared to encounter any risk to obtain it; and is willing to tender his gratuitous assistance at all hazards. Can such an offer be justly deemed a voluntary act? It is much rather to be viewed as a sacrifice to a sense of the high value of professional character, on first setting out in life."—" It is easy to foresee the surprise, and very probably the indignant opposition, with which the opinion—that there is neither justice nor propriety in engaging medical practitioners to undertake permanent, laborious, and responsible duties, without the means or the prospect of rendering any compensation for them —will be met by many."—" The community has been so long accustomed to the gratuitous services of the medical faculty in every form of charitable establishment, where they could be expected or wanted, and habit has so familiarized the thing, that it is scarcely considered as a boon."

But, although Dr Storer entertains, and hesitates not to declare, such sentiments, he, at the same time, " professes to feel a lively interest that the medical faculty, as a body, should continue to maintain, to its full extent, that reputation for disinterestedness and humanity, which has hitherto been conceded to it."

This, however, he thinks, must be done, not in the service of public institutions, but in " the *private* and *spontaneous* exercise of good will and kind offices to those who are most in need of them, and least in a condition to reward them."

ART. III.—*The Black Death of the Fourteenth Century.* From the German of I. F. C. HECKER, M. D. &c. Berlin. Translated by B. G. BABINGTON, M. D. London, 1833, 12mo, pp. 205.

THE great pestilence of the fourteenth century, which swept away, it is said, in the space of four years, a fourth of the population of Europe, has found an able, though fanciful historian in Dr Hecker of Berlin. This pestilence, denominated in Germany and the north of Europe the *Black Death*, and the ravages of which extended over a wider space, and with a more dreadful mortality than any other visitation of the same nature before or since, has been but slightly alluded to by general historians. Even medical writers have shunned the investigation of a subject which promised information so little satisfactory; and the cause of the plague or the pestilence has thus been left to the traditions of the vulgar, who have in all countries, and in all times, stifled inquiry, by referring the mortality and prevalence of diseases to the Divine displeasure. The appearance of a comet, the bursting of a volcano, or the shaking of an earthquake, are connected, in the minds of many, with every unusual appearance of disease; and even the production of insects in unwonted numbers, and other less palpable warnings, have been supposed to usher in the pestilence, and have been stated either as causes or effects of a tainted atmosphere, inimical to life. Even Dr Hecker himself seems inclined to think that there is a necessary connection between "mighty revolutions in the organism of the earth," and the "plagues which have visited the world."—"The powers of creation come into violent collision; the sultry dryness of the atmosphere; the subterraneous thunders; the mist of overflowing waters, are the harbingers of destruction. Nature is not satisfied with the ordinary alternations of life and death; and the destroying angel waves over man and beast his flaming sword."

Without denying that great and sudden changes in the constitution of the atmosphere may produce disease, either directly by acting on the human frame, or indirectly by affecting man through the medium of his food or his local situation, it may be remarked, that, beyond the qualities of humidity or dryness,—beyond the alternations of heat and cold,—little is satisfactorily known. The meteoric changes producing a succession of seasons, which affect the proper ripening of the crops that serve as nutriment to man and beast, have certainly been proved to induce disease from the scarcity or bad quality of the food. This fact has been observed from the earliest times; and in the oldest record of the human race, *famine*, or a deficiency of food, is always represented as ushering in the *pestilence*. Not only is this the case, in reference to famine produced by natural causes, or a deficiency of the crops, but even in artificial scarcity, occasioned by the operations of contending armies, as in towns besieged, the same effect is produced in a narrow space, though the other parts of the same country, not exposed to the same causes of disease, may enjoy their usual state of health. But, at the same time, it is readily granted, that changes may occur in the combinations of our atmosphere unfavourable to life, although not perceptible to the senses, or to be discovered by the most delicate instruments. It is well known, in the case of odours, that a space incalculably great may be filled by an odorous body without adding to the weight of the air; so, in the case of a supposed epidemic constitution of the atmosphere, it is perfectly possible that a source of disease may exist to a dangerous extent, without its presence being capable of being detected by the resources of the most refined chemistry. But allowing this as a possible case, by no means proves the actual existence of such causes of disease; and until the presence of noxious principles in the atmosphere be demonstrated, it is safer to look for less direct causes, in the state of the country, food, temperature, and other local circumstances, which may be induced by variations in the component parts of the atmosphere,—or in the meteorological alternations of extreme heat and cold, aridity and moisture, affecting the human constitution by means of the thousand channels which connect these changes with the health of man.

According to Dr Hecker, the Black Death of the 14th century was preceded by revolutions of nature such as had not been remarked to the same extent before. "From China to the Atlantic, the foundations of the earth were shaken,—throughout Asia and Europe the atmosphere was in commotion, and endangered, by its baneful influence, both vegetable and animal life." Fifteen years before the plague broke out in Europe, the indications of the coming desolation were observed in China. In 1333 a parching drought in the tract of country watered by the rivers Kiang and Hoai occasioned a famine. This was followed by torrents of rain in and about Kingsai, the capital of the empire, to such an unprecedented extent, that 400,000 people perished in the floods; and the mountain Tsincheou, sapped in its foundations, fell in, leaving vast clefts in the earth. In 1334 the neighbourhood of Canton was inundated; while in Tche, after an unexampled drought, a plague arose which carred off about five millions of people. A few months afterwards Kingsai was surprised by an earthquake; the mountains of Ki-ming-chan sunk below the surface; and a lake of more than a hundred leagues in circumference was formed on the site. In Hou-kouang and Ho-nan a drought of five months prevailed; and swarms of locusts destroyed the remaining vegetation. Renewed floods took place in 1336; and in 1337 four millions of people perished by famine from similar causes. Contemporaneous with these revolutions in China, Dr Hecker remarks, "uncommon atmospheric phenomena, and in the winter frequent storms, were observed in the north of France; and in 1333 an eruption of Etna took place."

In 1338 Kingsai was visited (according to Dr Hecker's investigations) by an earthquake of ten days' duration; and at the same time France suffered from a failure in the harvest. From this time till 1342, there was in China a constant succession of inundations, earthquakes, and famines; and in this latter year great floods occurred in the vicinity of the Rhine and in France. In 1343 the mountain Hong-tchang in China fell in, and caused a destructive deluge; and in other provinces of the empire, after three months' rain, inundations followed which destroyed seven cities. Violent earthquakes took place also in Egypt and Syria; and, in fine, the war of elements recurred in China in 1344, and floods and famine devastated various districts of that country till the year 1347.

Dr Hecker, who has an evident leaning to connect these deviations from the ordinary course of nature in Asia, with similar revolutions in Europe, traces in the older writers the recorded signs of terrestrial commotion, as they began in the island of Cyprus in the year 1348. An earthquake and hurricane almost converted this island into a desert; and a pestiferous wind spread an odour so poisonous, that many fell down suddenly and expired in agony. Various accounts quoted by Dr Hecker, the early record of magnified traditions, state, as subjects of common belief, that a thick mist advanced from the east, and spread itself over Italy; and that locusts in myriads, blown into the sea by a hurricane, produced noxious exhalations baneful to the principle of life. On the 25th of January in the same year an earthquake shook Greece, Italy, and the neighbouring countries. Naples, Rome, Pisa, Bologna, Padua, Venice, and many other cities suffered; villages were swallowed up, and castles, houses, and churches overthrown. In Carinthia thirty villages were demolished, and the city of Villach was almost completely destroyed. This earthquake, which lasted for a week according to some, or a fortnight according to others, extended as far as the neighbourhood of Basle, and recurred with intermissions until the year 1360. It was felt throughout Germany, France, Silesia, Poland, England and Denmark; and it is mentioned by Dr Hecker, in proof of a change in the constitution of the atmosphere, that the wine in the casks became turbid.

In addition to all this, portentous signs—extraordinary meteors—the appearance of which in all ages have powerfully impressed the uneducated mind, added horror to the actual evils of physical convulsions. A comet appeared in August 1347; a pillar of fire is related to have been seen on the 20th of December 1348, at sunrise, over the Pope's palace in Avignon; and a fireball in August of the same year hung over the city of Paris.

These meteoric and other changes were not without their effects upon the seasons, and the production of food. The crops generally failed; the grain was of bad quality; and in Italy and surrounding countries, a year before the Black Death burst out, with its typical forerunners, earthquakes and inundations, numbers of the poorer classes were starving for want of food. At

Florence in April 1347, it is said 94,000 loaves of bread, each of eight ounces in weight, were daily dispensed to the poor. The necessary and never-failing result of famine and its concomitants is disease; and as there existed at that time no extent of superabundant cultivation, and no general transit of superabundant produce,—when disease occurred, it made progress with giant steps in virulency, and was only mitigated by the exhaustion of the subjects thus subjected to its sway.

"Destruction by destruction was destroyed."

Such were some of the physical changes in the earth's surface, which, along with simultaneous changes in the constitution of the atmosphere, preceded the appearance of the Black Death in Europe. But Dr Hecker, though he mentions atmospheric influences as one cause of its production and increase, does not limit himself to this agency alone. Believing that the plague existed in Europe before nations were united by the bonds of commerce, and that its latent germs lurked unnoticed till a concurrence of atmospherical changes excited them into malignity, he accounts for the appearance in Europe of the Black Death of the fourteenth century, in the *first* place, from the corruption of the atmosphere; and *secondly*, from contagion. This latter agency, says he, "far more powerful than the excitement of the latent elements of the plague by atmospheric influences, was the contagion communicated from one people to another, on the great roads, and in the harbours of the Mediterranean." In this view, and supposing the disease to have originated in China, he attempts to trace the route of the caravans through Central Asia to Tauris. From Tauris ships took the produce of the East to Constantinople, the medium of connection between Asia, Europe, and Africa. Other caravans went from India to Asia Minor, and touched at the cities south of the Caspian Sea; and lastly, from Bagdad, through Arabia, to Egypt. In all these directions Dr Hecker supposes the contagion to have made its way; and he is disposed to believe that Constantinople and the harbours of Asia Minor were the foci of infection. From Constantinople the disease was communicated in 1347 to Cyprus, Sicily, Marseilles, and some of the sea ports of Italy; and the remaining islands of the Mediterranean—Sardinia, Corsica, and Marjorca,—were visited in succession.

In January 1348 this plague appeared at Avignon, and afterwards in other parts of France, and in all the southern provinces of Spain. At the close of the same year it made its appearance in Dorsetshire in England, and speedily spread over the whole country. In 1349 Ireland, Scotland, and Holland were visited by this plague; in 1350 Germany, Hungary, and the north of Europe; and in 1351 it broke out in Russia, more than three years after it had appeared at Constantinople. The appearance of the disease at different periods in different towns of the same district, is a puzzling fact in the explanation of its origin and progress through meteorological changes of the atmosphere; while, on the other hand, the transit of the disease by contagion supposes it to have proceeded from Constantinople by the circuit of Southern and Central Europe, England, the northern kingdoms, and Poland, before it reached the Russian territories,—in place of the more direct route from China by Tauris and the Caspian Sea.

The period of the appearance of the disease in England is by one author stated to be the month of September, and by another as just after Christmas. It raged about five months, according to Archbishop Parker; though, according to other authors, this plague prevailed in parts of London and its vicinity till autumn 1349. Short, on the authority of Johan. Cole de Billona, states that a cloudy and moist atmosphere, with a high degree of heat, had occurred for some years, and that a malignant peripneumony prevailed throughout Europe. The year 1347 was in England excessively rainy, and the air humid; and the prevalence of unusual numbers of loathsome insects is remarked, as proving the pestilential state of the air, not only in China, but in Europe. These unusual visitors are described (Webster's Hist. of Pestilential Diseases, i. 215.) "as young serpents, or as venomous insects, or as large vermin with tails and eight short legs,"—a description, adds Mr Webster, in which "probably a frightened imagination had some share of influence. But of the fact of their existence there can be no doubt." * In the Ouse there was a great inundation just before Ascension day; and the plague broke out in York immediately after.

The death of the fish in the rivers is also recorded as attend-

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* The wonderful animal here referred to as the harbinger of disease, and the sign of a vitiated atmosphere, at no distant date alarmed the inhabitants of Edinburgh by its appearance in great numbers in Blair Street. Crowds assembled to look upon the tiny monsters,—regarded as the forerunner of dreaded evils,—which no one dared to touch, and which none could name. This happened nearly thirty years ago, during the late war. Their appearance powerfully affected the minds of the vulgar; and the little serpents had the honour of being noticed in the newspapers. There were few entomologists at that time in Edinburgh, and perhaps not half a dozen were able to say they had ever seen the creature. The animal in question, with its long rat-tail, is the larva of a species of *Musca* which breeds in drains and sewers, and which, after passing a part of its existence in water as a larva, seeks the land to undergo its metamorphosis into a fly. In some seasons they are particularly numerous; and in the meadow ditches, while they formed the outlet of the common-sewers in the neighbourhood, they were annually to be found.

ing the Black Death in England. This circumstance, originating from what source it might, or whether absolutely or relatively true, gave rise to a report that the Jews had poisoned the wells and springs; and the consequence was, that the prejudices of the people were inflamed against the unprotected Israelites by this charge, and urged to new acts of cruelty and oppression. In some places of Germany many Jews were even assassinated on this fanciful charge. Disease among animals, particularly among sheep, the consequence perhaps of over-moist pasture or deteriorated herbage, is also recorded as occurring simultaneously with the plague to man. In England it is said 5000 died in one pasture; and both air and water were so saturated with the seeds of disease, that, as historians record, even the fowls and fishes were found with the characteristic blotches of the dominant plague.

In 1349 the Black Death reached Scotland. It proved fatal, according to Fordun, in forty-eight hours, (Fordun, xiv. 7.) and the bodies of persons seized swelled much. It was remarked as being particularly fatal among the poorer classes of the community. A disease or pestilence, with the same symptoms, is also recorded to have occurred in Scotland in 1361.

Dr Hecker, in his Account of the Black Death, limits the period of its more destructive violence in Europe, with the exception of Russia, from the year 1347 to 1350. The succeeding epidemics of the same century he does not consider as belonging to "the great mortality." On the contrary, he regards these recorded plagues as similar to the pestilences of former and succeeding times, which were distinguished from the Black Death, from not being accompanied by inflammation of the lungs, —and of which the seeds lurked in every country, ready to be excited under circumstances favourable to the production of disease. But the accounts transmitted of the succeeding years of this ill-fated century, do not bear out the doctor in his opinion upon this point; for the recurrence of the plague in Scotland in 1361, with exactly the same symptoms, is recorded by one of her most veracious historians; and meteorological changes of a similar nature seem to have preceded and accompanied a disease, differing only from the former, as acting upon a smaller amount of population.

At the close of Dr Hecker's period, in 1350, there were severe earthquakes in Italy. A severe drought distinguished the same year; and a comet appeared in 1351, accompanied by dreadful storms, and the bursting of a meteor. The winter following was severe. In 1352, 900,000 people are said to have perished by famine in China; in 1354, Africa and Cyprus were devoured by locusts; and in the same year, an epidemic madness prevailed in England. In 1358, the winter was particularly severe; and in the following year, 1359, an eruption is recorded to have taken place in Iceland, and a wasting plague in Italy. Florence alone lost 100,000 citizens; and, according to Petrarch, scarcely ten of a thousand survived. The mortality among women in child-bed is noticed as an adjunct of this plague; and a disease or murrain prevailed among the cattle. A remarkable storm of hail and snow took place in April 1360; and in January 1361, a violent tempest spread desolation over Europe. In 1361, the pestilence, in its renewed attack, became nearly general over Europe. Milan, which had escaped the scourge in 1348, was now attacked; and France, England, and Ireland, shared in the calamity. As to Scotland, it was computed that in that country one-third of the inhabitants perished, among whom were many persons of distinction.*

In March 1362, a comet with a vast coma appeared in the north-east; a new eruption of the active volcanos in Iceland took place; and a dearth, accompanied by a murrain among cattle, supervened. This last pestilence is said to have differed from the former in 1348, in that it was more severe in mountainous districts, which the former disease had not affected, and in attacking the nobility and rich people with more severity.† The comet and volcanos of 1362 were followed in 1363 by a winter, which lasted with unusual severity from September to April. The Rhine is said to have been covered with ice for ten weeks. The year 1365 was rainy, and 20,000 people in Cologne and its vicinity perished by the plague. In 1366, another eruption in Iceland took place, which destroyed seventy farms; and in England the year was remarked as a sickly one, and the deaths sudden. In March 1368, a comet appeared, and the crops failed. The necessary consequence of the failure of the crops was the *third* great plague, which had ravaged England in the reign of Edward III. It increased in virulence till the following year, when its ravages were greatest. It was particularly fatal about Oxford. In Ireland the disease appeared in 1370.

The last thirty years of the fourteenth century are signalized by similar meteorological changes, and failures in the crops, and diseases. In 1373, an epidemic madness prevailed among the lower orders in England; and in 1374, a similar affection among the inhabitants of France and Italy. In 1374, Iceland's volcanos were again in action; and famine and plague prevailed in Italy and some parts of France. In 1379, great sickness is recorded to have taken place in the north of England; and in 1380, another comet appeared. Earthquakes were felt in England in 1381-2; and the plague appeared at Avignon in France, which prevailed for the following four or five years in Italy, France, Germany, England, Ireland, Greece, and the East. An eruption of Etna took place in 1381, and the year closed with great rains. The year 1382 is remarked as being without winds. This plague is remarked as having been most fatal to children and to friars. The city of Lubeck is said to have lost 90,000 people. In 1388, on account of the drought, the Rhine was fordable at Cologne; in 1389 tempests raged in England; a singular meteor was seen; and great numbers of children died in all parts of England. In the following year the north of England was visited by plague; and gnats and flies in unusual numbers were the precursors or the evidences of the tainted atmosphere. Some parts of the continent were also at this time overrun with locusts. An uncommon redness of the sun distinguished July 1391, followed afterwards for six weeks by thick vapours or clouds; and in this year a malignant dysentery, the sequel of plague, as Mr Webster remarks, prevailed in England. This seems the last of the general calamities that fell upon the European people in the fourteenth century.

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* Fordun, xiv. 24.

† Webster's Hist. of Epidemic Diseases, i. 224.

The fifteenth century is distinguished by a succession of storms, comets, volcanoes, earthquakes, and all those physical changes, the consequences of which it is the delight of the geologist to investigate, but with less marked calamity to the human race than in the century preceding. As connected with the present subject, we only mention the sweating sickness, or *Sudor Anglicus*, which appeared in England in 1483, and return to the Black Death of the fourteenth century. The beginning of this century, though Dr Hecker passes in silence over its young years, was pretty prolific in the same kinds of natural phenomena,—comets, earthquakes, moist and dry seasons, and cold and wet ones; and these in their turn were naturally followed by their usual effects on vegetation and the productions of agriculture. The animals supported by the fruits of the earth must have been affected by the scarcity or unwholesomeness of unripened or contaminated food, when no commerce existed to balance the wants of one country by supplies from another; and these facts account, in no improbable manner, for the effects of scarcity, damp, and cold, aggravating disease among a half-civilized people. The murrain among horned cattle, and the diseases of sheep, which often accompanied the plagues of the middle ages, are referrible to the same causes.

Having thus noticed the principal concomitants of the Black Death and its ravages in Europe in the fourteenth century, we now proceed to make our readers acquainted with the other portions of Dr Hecker's volume, viz. the chapters on the description of the disease,—its mortality,—and the means resorted to by the physicians of the period to mitigate its virulence or arrest its progress. According to Dr Hecker, the Black Death of the fourteenth century was "an oriental plague, marked by inflammatory boils and tumours of the glands, such as break out in no other febrile disease." Kantakusenus, whose son Andronicus died of the disease in Constantinople, remarks, "great impost-humes of the thighs and arms of those affected, which, when opened, afforded relief by the discharge of an offensive matter." Buboes, the infallible signs of the oriental plague, are, Dr Hecker thinks, indicated in this passage; as mention is made of smaller boils on the arms, face, and other parts of the body, and separately blisters, and in many cases black spots over all the body, either single or confluent.

"These symptoms were not all found in every case. In many, one alone was sufficient to cause death, while some patients recovered, contrary to expectation, though afflicted with all. Symptoms of cephalic affection were frequent; many patients became stupified and fell into a deep sleep, losing also their speech from palsy of the tongue; others remained sleepless and without rest. The fauces and tongue were black; and as if suffused with blood; no beverage would assuage their burning thirst, so that their sufferings continued without alleviation until terminated by death, which many in their despair accelerated with their own hands. Contagion was evident, for attendants caught the disease of their relations and friends, and many houses in the capital were bereft even of their last inhabitant. Thus far the ordinary circumstances only of the oriental plague occurred. Still deeper sufferings, however, were connected with this pestilence; such as have not been felt at other times; the organs of respiration were seized with a putrid inflammation; a violent pain in the chest attacked the patient; blood was expectorated, and the breath diffused a pestiferous odour.

"In the west, the following were the predominating symptoms on the eruption of this disease. An ardent fever, accompanied by an evacuation of blood, proved fatal in the first three days. It appears that buboes and inflammatory boils did not at first come out at all, but that the disease, in the form of carbuncular affection of the lungs, effected the destruction of life before the other symptoms were developed."—"After this period, buboes in the axilla, and in the groin, and inflammatory boils all over the body, made their appearance; but it was not until seven months afterwards that some patients recovered with matured buboes, as in the ordinary milder form of the plague."—Pp. 7–9.

"The like was seen in Egypt. Here also inflammation of the lungs was predominant, and destroyed quickly and infallibly, with burning heat and expectoration of blood." In Florence, according to Boccacio, the disease commenced with "tumours in the groin and axilla, varying in circumference up to the size of an apple or an egg, and called by the people pest-boils. Then there appeared similar tumours indiscriminately over all parts of the body, and black or blue spots came out on the arms or thighs, or on other parts, either single and large, or small and thickly studded. These spots proved equally fatal with the pest-boils, which had been from the first regarded as a sure sign of death. No power of medicine brought relief—almost all died within the first three days, some sooner, some later, after the appearance of these signs, and for the most part entirely without fever or other symptoms."—Pp. 10, 11.

"In Germany there was a repetition in every respect of the same phenomena. The infallible signs of the Oriental bubo-plague with its inevitable contagion were found there as every where else."—"In Austria, and especially in Vienna, the plague was fully as malignant as any where, so that the patients who had red spots and black boils, as well as those afflicted with tumid glands, died about the third day." In France "many were struck as by lightning, and died on the spot; and patients with enlarged glands in the axilla and groins scarcely survived two or three days."—"In England the malady appeared as at Avignon, with spitting of blood, and with the same fatality; so that the sick who were afflicted either with this symptom or with vomiting of blood, died in some cases immediately, in others within twelve hours, or at the latest in two days. The inflammatory boils and buboes on the groin and axillæ were recognized at once as prognosticating a fatal issue, and those were past all hope of recovery in whom they arose in numbers all over the body."—"Barnes describes the external symptoms in the following terms: "Knobs or swellings in the groin or under the arm-pits, called kernels, boils, blains, blisters, pimples, wheals, or plague-sores."—Pp. 5–18.

We have taken this account of the symptoms chiefly from Dr Hecker, who further observes, that the disease often assumed different forms; and that, "while the essence of the poison which it produces remains unchanged, it is proteiform in its varieties, from the almost imperceptible vesicle, unaccompanied by fever, which exists for some time before it extends its poison inwardly, and then excites fever and buboes, to the fatal form in which carbuncular inflammations fall upon the most important viscera."—P. 20, 21. "Only two medical descriptions of the malady," (adds he,) "have reached us, the one by Guy de Chauliac, the other by Raymond Chalin de Vinario. The former takes notice only of fatal coughing of blood; the latter, besides this, notices epistaxis, haematuria, and fluxes of blood from the bowels, as symptoms of such decided and speedy mortality, that those patients in whom they were observed, usually died on the same or the following day."—Pp. 23, 24. Dr Hecker further mentions, on the authority of Chalin, who witnessed the disease in 1348, 1360, 1373, and 1382, that, after the first fury of the disease was spent, the pestilence passed into the usual form of the oriental plague; "internal carbuncular inflammations no longer took place, and hemorrhages became phenomena no more essential in this than they are in any other febrile disorders."—P. 25.

Mr Webster's belief in the direct origin of the disease from meteorological causes; and his theory, that the plague is always preceded for months and even years by other malignant fevers, though stated to account for the contrariety of opinion on the identity of the disease at its commencement, leads almost necessarily to the conclusion, that these malignant fevers, increasing in virulence as their sphere was enlarged, degenerate finally into the true plague, as naturally

"as brooks form rivers—rivers swell to seas."

"This circumstance," says he, "might create a small difference in the accounts of the origin of the plague; inaccurate observers mistaking the one disease for the other, or rather naming the previous putrid fever the plague, before it put on the characteristic symptoms."—(Webster, Vol. i. p. 213.) Here he has taken some of the symptoms related by authors as evidence of the existence of a "malignant pleurisy and peripneumony, which," (he says,) "always occur during a period of general contagion." But Mr Noah Webster, though an excellent compiler, is not professionally medical, and hence his opinion, taken possibly from some medical author of late date, will go for little when opposed to Chalin, the witness of the disease in its varied forms. From the appearance of congenerous affections as harbingers of plague, and from the disappearance in Europe of the disease for more than a century, still leaving these typhoid distempers in more or less virulence, according to local circumstances, one is almost tempted to believe, that were it possible we could retrograde to the dirty lodging, feeding, and clothing, of the fourteenth century, and were these to be aggravated by severe seasons, and absolute scarcity of food, Europe would again, without importation, have to mourn the fatality of the *Black Death*.

Enough has been stated to show that the disease which prevailed in Europe in the fourteenth century was identical with the oriental plague in all its more marked symptoms. Like the plague, too, it appears to have been powerfully contagious—the breath of the sick and the infectious atmosphere around extending the disease to all who approached. Parents abandoned their children—children their parents—and the nearest ties of relationship were for the time dissolved. Those who fled from the city to the country carried the seeds of the disease along with them. Even sailors found no refuge from this foe to life on their peculiar element; for it is related that ships were seen driving about on the ocean at the mercy of the winds and currents, and drifted on shore, whose crews had perished to the last man. The inferior animals seem also to have suffered in a certain degree, for numbers of dogs, cats, fowls, and other animals fell victims to the contagion.

That many of the epidemic diseases which attacked the nations of Europe with direful mortality during the preceding and following centuries were not the oriental plague, as at present characterized, will not be disputed. Every disease that prevailed to a fatal extent—that was beyond the knowledge or experience of a single life,—was in these ages of little refinement, and less observation, looked upon as a pestilence or plague—the most impressive terms in the language being selected as names superlatively appropriate to the cause of so much destruction of human life. Even an epidemic small-pox, or scarlet-fever, or measles, breaking out among people in such a state of civilization, would almost account for all the mortality that occurred during the prevalence of the Black Death. But from the general record of the appearances put on by the disease in the fourteenth century, and its resemblance in symptoms and effects to the oriental plague, there appears little room to doubt, that, however originating, or introduced into Europe, and propagated into its most remote and coldest portions, it was identical with the eastern pestilence. Another disease, it may be remarked, now almost if not totally confined to the countries where plague seems indigenous, was then extremely common in Europe, viz. *leprosy*. Establishments for the reception of lepers all over northern Europe attest the former frequency of this disease; and even in our own country, and amidst the keen air and breezes of Scotland, these hospitals were numerous, and the disease common. It is therefore extremely probable, that the plague as well as leprosy were at one time of frequent occurrence among the European communities; and that the same diseases do not now occur, must be placed to the account of the improved modes of living among the present nations, compared with the accommodations of their semibarbaric ancestors. Every thing connected with the food, clothing, and lodging of the European population has been improved beyond what could have been conceived five hundred years ago; and thousands in the humblest walks of life in our own country now possess comforts in all these respects much superior to what the nobles and princes of these early times enjoyed.

Though Dr Hecker only dwells minutely on one period of disease, yet either plague or a similar affection occurred previous to 1348, and at intervals afterwards in that and the succeeding centuries. In Scotland, for instance, a disease named the plague prevailed in Edinburgh in 1513–14, 1520, 1568, 1574, 1585, 1604, 1606, and for the last time in 1645. The disease seems, however, to have lingered for some time longer in the southern parts of the island, for in 1665 the plague on its final appearance carried off 68,000 inhabitants of London. The great fire which occurred in that city in 1666, by destroying at once a great portion of the ill-ventilated and crowded houses and streets, and thus giving rise to an improved architecture and accommodation,—together with the introduction of water in plenty, cleanliness, and improved modes of living,—are supposed sufficient to account for the disappearance of plague in Britain. A minute and generally accurate chronological account of the chief epidemic and pestilential diseases that have prevailed from the earliest times, will be found in the work to which we have already referred.*

We now come to Dr Hecker's chapter on the mortality occasioned by the Black Death of the fourteenth century. Dreadful as we can conceive the ravages of a virulent disease among nations totally unprepared to modify the scarcity of food by importations from one country to another,—and whose habits and manners were the reverse in every respect of what we should consider necessary to mitigate a prevailing epidemic,—we can scarcely arrive at the conclusion of Dr Hecker, that Europe lost 25,000,000 of inhabitants by the Black Death. Lord Hailes, indeed, from the incidental details left by British and other writers, of the number of persons who perished by this plague, in communities whose numbers were stated or nearly known, was of opinion that an approximation might be made by this means to the comparative population of the principal European states in the fourteenth century. Dr Hecker arrives at his conclusion by means exactly the reverse. He assumes, in the first place, that the population of Europe at present being 210,000,000, it may be supposed to have been at least one-half, or 105,000,000, in the fourteenth century; and on this assumption states the total mortality at one-fourth of this number, or 25 millions of people.

At the present day, it is confessedly impossible to ascertain, with any approach to accuracy, the comparative population of the chief European states in the fourteenth century; and still less is it possible to speak positively of the numbers of that population cut off by a disease which paralyzed by its dreadful rapidity of progress, and its sudden fatality, all the powers and energies of the human mind. At that period, and amidst such dangers, bills of mortality kept with undeviating accuracy could not be expected; and extreme exaggeration of good or evil seems a natural expression of hope or fear in times of public alarm. The

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* A Brief History of Epidemic and Pestilential Diseases. By Noah Webster. 2 vols. 8vo. Lond. 1800.

> ——— inbred enemy
> Forth issued, brandishing his fatal dart,
> Made to destroy:—They fled and cried out—DEATH;
> Earth trembled at the hideous name, and sigh'd
> From all her caves, and back resounded—DEATH.

The details of the amount of the calamity, besides, from the paucity of contemporary accounts, were necessarily drawn up from traditional recollections; and thus sources of error can scarcely fail to have arisen, which modern writers have no opportunity of correcting. With these observations, we give from Dr Hecker and Mr Webster, some of what they account the more credible particulars of the mortality of the Black Death. There died of the Black Plague

In Florence, -	60,000
In Venice, -	100,000
In Marseilles in one month, -	16,000
In Sienna, -	70,000
In Paris. -	50,000
In St Denys, -	14,000
In Avignon, -	60,000
In Strasburg, -	16,000
In Lubeck, -	90,000*
In Basle, -	14,000
In Erfurt, at least,	16,000
In Weimar, -	5,000
In Limburg, -	2,500
In London, at least,	100,000
In Norwich, -	51,100
Yarmouth, -	7,052
Franciscan friars in Germany, -	124,434
Minorites in Italy,	30,000

"In the East (says Mr Webster) there perished twenty millions in one year. In Spain the disease raged three years, and carried off two-thirds of the people. Alphonso II. died of it while besieging Gibraltar."

"In this fatal period (continues the same author) the apprehension of death destroyed the value of property. In England, and probably in other countries, cattle were neglected, and they run at large over the country. The corn perished in the fields for want of reapers; whole villages were depopulated; and, after the malady ceased, multitudes of houses and buildings of all kinds were seen mouldering to ruins. A house which before had been worth forty shillings, after the sickness sold for half a merk."—(Webster, i. 217, 218.)

The mortality in Asia was not less in comparison. "Kairo lost daily, when the plague was raging with its greatest violence, from 10, to 15,000: being as many as in modern times, great plagues have carried off during their whole course. In China more than thirteen millions are said to have died; and this is in correspondence with the certainly exaggerated accounts from the rest of Asia. India was depopulated, Tartary, the Tartar kingdom of Kaptschak,

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* According to Webster; Dr Hecker says 9000.

Mesapotamia, Syria, Armenia, were covered with dead bodies—the Kurds fled in vain to the mountains. In Caramania and Cæsarea, none were left alive. On the roads—in the camps—in the caravansaries, unburied bodies alone were seen; and a few cities, only (Arabian historians name Maara el Nooman, Schisur and Harem) remained in an unaccountable manner, free. In Aleppo 500 died daily; 22,000 people, and most of the animals, were carried off in Gaza within six weeks. Cyprus lost almost all its inhabitants; and ships without crews were often seen in the Mediterranean, as well as in the North Sea, driving about and spreading the plague wherever they went on shore. It was reported to Pope Clement at Avignon, that throughout the East, probably with the exception of China, 23,840,000 people had fallen victims to the plague. Considering the occurrences of the fourteenth and fifteenth centuries, we might on first view suspect the accuracy of this statement. How (it might be asked) could such great wars have been carried on—such powerful efforts have been made;—how could the Greek empire, only a hundred years later, have been overthrown, if the people really had been so utterly destroyed."—Pp. 55–57.

There is certainly much exaggeration in the numbers stated to have perished in the plague of 1348, 1349. A near approximation to truth cannot be expected, in the absence of written records, from the traditionary notices embodied by later writers. It is, however, pretty certain, that at least, the statement regarding Norwich, the population of which city could not have amounted to the numbers stated to have died of this disease in the fourteenth century, must be grievously wrong. And in another case, the free city of Lubeck, stated by Webster on one authority, to have lost 91,000 of its inhabitants, has been ascertained by Dr Hecker on another and more probable statement, to have only lost 9000. But all accounts agree in stating the number of lives lost by this disease to have been immense; and though other visitations of the same kind were subsequently experienced, the plague which broke out in 1348, and continued afterwards at intervals through the fourteenth century, still lingers in tradition as pre-eminently distinguished by the name of the *Black Death*.

The next chapter of Dr Hecker, is on the moral effects induced by the mortality of the plague on the survivors. "The mental shock sustained by all nations during the prevalence of the black plague, is (says Dr Hecker) without parallel and beyond description." Many fell victims to the fear of approaching danger, the stoutest-hearted lost confidence; and as the natural expression of feeling among those whose ties to earth might be dissolved in a moment, the eyes of the multitude were raised to the source from whence alone could come their aid, and they sought refuge in the duties and consolations of religion. This general and natural feeling, however, gave rise in Germany, to a new brotherhood or sect of *Flagellants*, or brethren of the Cross, as they called themselves, who took upon them as deputies the repentance of the people, and offered up prayers and supplications to the Divinity, that the plague might be stayed. This order consisted chiefly of the lower classes, either actuated by sincere contrition, or who availed themselves of this pretext for idleness. But the purpose of their association gained them reputation,—they were welcomed by the people with enthusiasm—and were eventually joined by many nobles and ecclesiastics. These travelling bands, augmented in many cases by children, honourable women, and nuns, marched through the cities in procession, robed in sombre garments, with red crosses on the breast, back, and caps. Triple scourges, tied in three or four knots, in which points of iron were sometimes affixed, formed part of their appointments, and gave the appropriate name of Flagellants to the fraternity. Penance was performed twice a-day; and they scourged themselves amid the singing of psalms and supplications for relief from the terrors of the plague. As the number of Flagellants increased, their leaders indicated the continuance of the order, and thus alarmed the regular churchmen, whose province alone it was to impose penance, and to intercede with the saints. The Sorbonne at Paris and the Emperor Charles applied to the Holy See for assistance to put down these fanatical intruders; and the Pope prohibited the continuance of their absurd pilgrimages.

A still more serious consequence followed the appearance of the Black Death of 1348. To account for the general mortality, the Jews, whose character among Christians never appears to have stood very high, were accused of having poisoned the wells or infected the air; and they were, in consequence, exposed to all the cruelties which semibarbarians under the cover of law could inflict. The persecution of this ill-fated people commenced at Chillon, on the Lake of Geneva, in September and October 1348, by instituting criminal proceedings against them. Under the influence of torture, some of the unfortunate creatures, like the witches of our own country in much later times, confessed themselves guilty, to insure a speedy end to their torments; and hence a crusade against the race took place in the different provinces of Germany. The Jews in Basle were, without trial, inclosed in a wooden building, and burnt by the populace. A similar expression of popular indignation took place in Freyberg. In Mayence, 12,000 Jews are said to have been put to death; and at Eslingen the whole Jewish community, to save themselves from savage outrage, voluntarily burned themselves in their synagogue. In England a similar accusation was laid to the charge of the Israelites; but such excesses of popular vengeance did not occur. In an appendix to the work, Dr Hecker gives the confession of the Jews tried at Chillon from Königshoven's Chronicle.

The last chapter of Dr Hecker's work is entitled, "Physicians,—the medical talent which encountered the great mortality." Of these, Gentilis of Foligno, a celebrated teacher of medicine in Perugia, who in June 1348 fell a sacrifice to the plague in the discharge of his duty, is first mentioned. He, in common with many of his contemporaries, believed in a putrid corruption of the blood in the lungs and in the heart, which was caused by the tainted atmosphere. The inference from this was, that, to remove the exciting cause, the deterioration of the air, it should be purified by means of fires of odoriferous wood. Bleeding and purging at the commencement of the attack was prescribed; ablution with vinegar or wine; the sprinkling of the dwellings with vinegar; and the smelling of camphor or other volatile substances was recommended. Gentilis disregarded, it is said, the astral influences,—asserted the corruption of the blood in the lungs and heart,—and believed in the contagious nature of the disease, and its communication from place to place. Guy de Chauliac, on the contrary, supposing the disease to originate in a grand conjunction of the three planets, Saturn, Jupiter, and Mars, in the sign of Aquarius, fixed the date of the origin of the disease at this unfortunate conjunction, on the 24th of March 1345; and accounted the corruption of the fluids, debility, &c. as subordinate causes. The quality of the air and of the other elements was so altered by this conjunction as to drive the poisonous fluids towards the internal parts of the body; whence, of course, fever and spitting of blood in the commencement, and afterwards a deposition in the form of glandular swellings and inflammatory boils."—p. 146.

Santa Sofia, a native of Padua, who treated plague patients at Vienna, distinguishes *pestilence* from *epidemie* and *endemie*, in that the first calls forth diseases of different kinds; while *epidemie*, on the contrary, is confined to one disease, for example influensa, and *endemie* originates only in local telluric changes. This author refers the causes of the pestilence and epidemie to astral influences—to extensive putrefaction of animal and vegetable bodies —bad diet, and want. All fevers called forth by the pestilence, according to the same authority, are of the putrid kind; and he held epidemic small-pox and measles to be infallible forerunners of plague. A similar belief prevails in the East to this day.—(Hecker, 150, 151.)

Chalin de Vinario, besides acknowledging astral and terrestrial influences in producing this disease, asserts that "all epidemic diseases might become contagious,* and all fevers epidemic." These three physicians were all believers in the doctrine of contagion; and Michael Savonarola, professor in Ferrara, (1462,) adopts this principle as the foundation of his definition of plague. "Febris pestilentialis est febris contagiosa ex ebullitione putrefactiva in altero quatuor humorum cordi propinquiorum principaliter."—(Hecker, pp. 155, 157.)

As to the means taken to arrest the progress of the disease, or to effect its cure, Gentilis thought, that as to the first every thing depended upon the purification of the air by large fires of odoriferous wood. The healthy were recommended to wash themselves frequently with vinegar or wine, and to inhale the odours of camphor and other volatile substances. For the second, bleeding and purging at the commencement of the disease were the remedies upon which he depended. Purging with aloetic pills; bleeding; purification of the air by means of large fires; the use of treacle; frequent smelling of volatile substances; the internal use of Armenian bole, and ascescent food, were recommended by Guy de Chauliac, in addition to which he advised isolation and flight. The remedies of Santa Sofia were much the same as the others; and all treated the tumid glands and inflammatory boils with emollient and stimulating poultices, or the actual cautery. Chalin de Vinario moderated the inflammation of the glands by leeches; counteracted inflammatory excitement in the young by cupping, and reserved full bleeding for priests evidently plethoric, as most who were bled in a certain stage died.—P. 156.

The Medical Faculty of Paris, called upon on the emergency of the occasion to deliver their opinion on the causes of the Black Plague, and on the proper means of preventing its spread, put forth a document, which seems to have formed the model upon which succeeding boards of health have acted on occasions of threatened pestilence. After setting out with making known the causes of the plague—astral combinations, and a vapour generated in consequence from the great sea, which spread its baneful steams over Europe—this learned body promulgated a series of directions or precepts, the neglect of which they announced would be followed by "immediate death—except the grace of Christ preserve their lives."

"We are of opinion, that the constellations, with the aid of Nature, strive, by virtue of their divine might, to protect and heal the human race; and to this end, in union with the rays of the sun, acting through the power of fire, endeavour to break through the mist. Accordingly, within the next ten days, and until the 17th of the ensuing month of July, this mist will be converted into a stinking deleterious rain, whereby the air will be much purified. Now, as soon as this rain announces itself, by thunder or hail, every one of you should protect himself from the air; and, as well before as after the rain, kindle a large fire of vine-wood, green laurel, or other green wood; worm-wood and chamomile should also be burnt in great quantity in the market places, in other densely inhabited localities, and in the houses. Until the earth is again completely dry, and for three days afterwards, no one ought to go abroad in the fields. During this time the diet should be simple, and people should be cautious in avoiding exposure in the cool of the evening, at night, and in the morning. Poultry and water-fowl, young pork, old beef, and fat meat, in general, should not be eaten; but, on the contrary, meat of a proper age, of a warm and dry nature, by no means, however, heating and exciting. Broth should be taken, seasoned with ground pepper, ginger, and cloves, especially by those who are accustomed to live temperately, and are yet choice in their diet. Sleep in the day-time is detrimental; it should be taken at night until sunrise, or somewhat longer. At breakfast, one should drink little; supper should be taken an hour before sunset, when more may be drunk than in the morning. Clear light wine, mixed with a fifth or sixth part of water, should be used as a beverage. Dried or fresh fruits with wine are not injurious; but highly so without it. Beet-root and other vegetables, whether eaten pickled or fresh, are hurtful; on the contrary, spicy pot-herbs, as sage or rosemary, are wholesome. Cold, moist, watery food is, in general, prejudicial. Going out at night, and even until three o'clock in the morning, is dangerous, on account of the dew. Only small river fish should be used. Too much exercise is hurtful. The body should be kept warmer than usual, and thus protected from moisture and cold. Rain-water must not be employed in cooking, and every one should guard against exposure to wet weather. If it rain, a little fine treacle should be taken after dinner. Fat people should not sit in the sunshine. Good clear wine should be selected and drunk often, but in small quantities, by day. Olive oil, as an article of food, is fatal. Equally injurious are fasting or excessive abstemiousness, anxiety of mind, anger, and excessive drinking. Young people, in autumn especially, must abstain from all these things, if they do not wish to run a risk of dying of dysentery. In order to keep the body properly open, an enema, or some other simple means, should be employed when necessary. Bathing is injurious. Men must preserve chastity as they value their lives. Every one should impress this on his recollection, but especially those who reside on the coast, or upon an island into which the noxious wind has penetrated."—Pp. 132–135.

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* Morbos omnes pestilentes contagiosos, audacter ego equidem pronuntio et assevero.

Such are the accounts which have been collected by Dr Hecker and others relative to the plague of the fourteenth century. The measures taken to arrest the progress of similar diseases, by isolation and prevention of intercourse, at the close of this century, form the first germ of those quarantine laws which are now established in all the maritime towns of southern Europe. At this early period it was remarked, that though the cause of disease seemed a general one, yet that, unaccountably, places were passed over for the time; and that isolation secured indemnity from the prevalent malady. The Pope Clement VI. shut himself up at Avignon, and was safe; and Milan averted the calamity for years. We are totally in the dark as to the local causes which might have secured a temporary exemption from this baneful disease; but the same circumstance has been observed in the late epidemic cholera, without the cause of exemption having been satisfactorily ascertained. In spite of all the dreaded and dreadful opportunities of observing the progress of epidemic disease, facts are still wanting to enable us to decide with any thing like certainty on the sources of the evil. One thing only is proved, and that is, that scarcity of food, inclemency of season, filth, and all the deprivations of poverty, if they do not actually generate pestilential disease, at least endow it with tenfold mortality; and that disease so aggravated, becomes also contagious to a certain extent. *

The observation of the physicians of subsequent ages have not much increased the amount of our knowledge regarding the origin of plague. If we lay aside the astral conjunctions of the Paris Faculty of the fourteenth century, their account of the origin of the disease is not much different from that supported in modern times,—its origin in the East, and transmission by contagion to the nations of Europe. Dr Mead's opinion, as versified by the poet of the Seasons, is still that of most physicians.

> From stifled Cairo's filth, and fetid fields
> With locust-armies putrefying heap'd,
> This great destroyer sprung.

But from the scanty notices of the Black Death and its concomitants, which Dr Hecker and Mr Webster have placed before us, aided by the incidental notices of early chroniclers; from the state of society in Europe during the middle ages, in the lowest state of civilization, and exposed, on the slightest failure

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* In proof of the disease being aggravated, if not occasioned, by the modes of living and deprivation of the lower classes, Barnes relates, that "though innumerable numbers of the common sort of people died, chiefly old men, women, and children, yet (which is wonderful) not one king or prince of a nation is said to have died through all the world! And even of nobles but a very few were taken away at this time, especially of the English nation."—In another place he mentions the remarkable exemption of those who lived amid the free air of the more elevated portions of the country: "As for those who were true Irishmen born, and dwelt in the hilly countries, it scarce just saluted them; so that they suffered but little or no loss thereby."—Barnes's Hist. of Edw. III., p. 438, 440. Fol. Camb. 1688.

of an expected crop, to all the miseries of famine,—one is half forced to believe, that all the low forms of European fever require only to be stimulated into severer action by the causes now alluded to, in order to produce the plague, the pestilence, or the Black Death.

Mr Webster's opinion, as expressed in his Introduction, is in consonance with that now stated, as a necessary inference from the facts detailed. "Whether these (the yellow fever and plague) are diseases specifically distinct, or only the same disease varied and modified by climate, season, or other circumstances, is a question that belongs to the faculty. It is sufficient for my purpose to observe, that in most of the symptoms they agree, that they are pestilential, and greatly to be dreaded by mankind. I shall therefore treat them as different forms of the same disease."—Pp. xii. xiii.

Again, having satisfied himself that yellow fever and plague are varieties of the same disease, and that both originate from similar causes in different countries, without the necessity of supposing importation, Mr Webster says, "That quality of a disease which, though insalutary, will not communicate it without the aid of other causes, as warm weather, or peculiar situation and habit of body, and which requires the healthful person to be for a considerable time under its influence to give it effect, may be called *infection*. Such is the quality of the plague in all its forms, dysentery, and typhus fever."—Pp. xiii. xiv.

These views, however, we must say that we feel it impracticable to adopt; and that we may not lead our readers to imagine that the commendation now given to the general spirit of the researches of Mr Webster, and the philosophical character of his mode of investigation, implies the adoption of all his conclusions, we feel it requisite at present to state shortly what we conceive has been well ascertained by observation, regarding the distinctive characters of yellow fever and plague.

It is well known to all practical physicians, in the *first* place, that, however yellow fever may occasionally show itself in countries without the limits of the tropics, it is in general a tropical disease, and can exist only under the influence of a degree of continued atmospheric heat approaching that of the tropics. Conversely, genuine carbuncular and glandular plague has never been known within the tropics, and though very prevalent in the countries situate along the limits of the tropic of Cancer, it has never been known in the remote parts of Upper Egypt, above the Cataracts, or in Ethiopia, or, in short, in any equinoctial country either of the old or new continent. Even in the towns of Lower Egypt and Syria it disappears on the approach of that degree of heat which would infallibly engender yellow fever, and it reappears in the same places in the close of autumn, and in the winter, upon the approach of a degree of cold under which yellow fever would assuredly cease to prevail.

In the *second* place, the two diseases are not less distinct in their nosological and pathological characters than in their generating causes. While in yellow fever the surface assumes a yellow tint, from decomposition of the blood of the cutaneous capillaries, and passive hemorrhage, more or less profuse, takes place from the gastric and gastro-enteric mucous surfaces; in plague, on the contrary, various parts of the surface, and sometimes of the internal organs, become mortified or gangrenous, and more or fewer of the lymphatic glands are smitten with a species of inflammatory, suppurative, or gangrenous inflammation. Suppurations of the parotid glands are indeed occasionally seen in yellow fever; but rarely or never does the disease present suppuration of the inguinal or axillary glands; and carbuncles or mortified spots were never heard of in it.

Conversely, plague does not necessarily exhibit black vomit, or any of the passive hemorrhages so common in yellow fever; and while petechiæ are very common in the former distemper, they are rarely or never observed in the latter.

In short, did we feel authorized to reason from causes and symptoms taken together, we think it would be a most just inference to say, that, on the one hand, yellow fever is to be regarded as the most intense and virulent form of remittent fever, or that engendered by the influence of the atmosphere on the terrestrial surface, and not susceptible of personal transmission;—and that, on the other hand, plague is to be viewed as the most exquisite and virulent degree of *Synochus* or *Typhus*, or that form of fever which, whether rising spontaneously among numerous assemblages of filthy human beings, under certain atmospherical conditions, or introduced, very speedily acquires the property of being propagated from one individual to another, or, in other words, is at once atmospherical and contagious.

We have only now to regret that Dr Hecker's investigations did not lead him to collect the fragments of information scattered in the earlier writers, illustrating the style of living, food and accommodation of the lower classes, during the period of which his volume treats. Without statements of this kind, every conclusion drawn from the reported prevalence or fatality of disease must be necessarily defective, in as much as all the essential particulars of the case are not stated. We could also wish that he had extended his researches to a wider period, and not fixed upon one single point in a century, which might have been better illustrated by generalizations on a larger scale. The work of Noah Webster contains a mine of matter relative to epidemic diseases from the earliest times, which only requires to be compared with the relative statistics, to throw much light on the rise and progress of disease in the middle ages. Dr Hecker does not seem to have been aware of the existence of this work; at least we have observed no direct reference to its contents, though embracing most of the facts he has detailed, besides numberless others, and extended over many centuries. Dr Babington, the translator,—and the translation is a very good one,—also neglects to notice, for we cannot suppose him ignorant of, the work of the industrious American. Had Mr Webster's work not existed, we should have felt much indebted to Dr Hecker for his little work, which is interesting in many respects; and which, from its unassuming form and price, may give information to many who never heard of Noah Webster,—the three plagues of the reign of Edward III.,—or the Black Death of Germany.

Art. IV.—*A Treatise on Diseases of the Eye.* By W. Lawrence, Esq. F. R. S., Surgeon to St Bartholomew's Hospital, &c. &c. &c. Pp. 730. London, 1833. (Concluded from Vol. xli. No. 118, p. 195.)

We now resume our examination of this instructive treatise at the point at which we paused in last number; and we believe we cannot do better than give a simple analytical sketch of the subsequent part of the work.

Chapter VI.—*Wounds of the Eye and its Appendages.*—In this chapter the effects of blows, wounds, and other injuries of the eye and its appendages are fully described. That inflammation, following such injuries, is the consequence always to be dreaded, and always to be prevented and subdued, are strongly inculcated. Absolute rest, bleeding, and attention to the other parts of the antiphlogistic treatment, are to be strictly enjoined.

In treating of wounds of the sclerotica, the following passage occurs, which appears to us to require remark. "Wounds of the sclerotic," says Mr Lawrence, "do not unite; the fissure, in the cases just described, is permanent, and the punctured opening made in depression of the cataract is equally so." This result of such injuries as an uniform occurrence, our experience certainly prevents us from giving assent to. In the case alluded to by Mr Lawrence, a small vesicle projected from the wound for several weeks after. This we apprehend to have been a portion of the vitreous humour, which may have prevented the union of the wound by the time at which Mr Lawrence saw it. But we have seen injuries of the sclerotica where portions of the choroid have projected, and incisions made in the sclerotica to evacuate fluid from the globe, where complete union and closure of the wound took place. We are equally confident that the wound formed by a cataract-needle closes completely. If the statement of Mr Lawrence were correct and uniform, we do not understand how this should form an exception to the general reparation which takes place in injured parts.

One important effect of a blow upon the eye is the separation or dislocation of the lens. In such cases it occasionally gets forward through the pupil into the anterior chamber of the aqueous humour. "When the dislocated lens," says Mr Lawrence, "has passed into the anterior chamber, it acts as a foreign body, irritating the surrounding parts, causing inflammation of the eye, and severe pain in the organ, brow and head. The inflammation and pain which continue in spite of antiphlogistic treatment, may be most speedily and effectually relieved by removing the irritating cause; that is, by extracting the dislocated lens through an opening made in the cornea with a cataract knife."—P. 144. In extracting the lens under such circumstances, two important difficulties present themselves, 1*st*, operating on a tender inflamed eye, which is in a state very unfavourable for getting any operation accomplished, even of much less difficulty; 2*d*, the difficulty of carrying the knife through the anterior chamber, and making a proper incision in the cornea, in consequence of the lens occupying the greater part of the cavity. These difficulties seem to have led Mr Watson to another mode of operating, which we should consider preferable. The pupil having been dilated, he introduces a curved needle behind the iris, brings the point of it forward through the pupil, and lays hold of the lens, which is carried backwards and depressed into the vitreous humour.*

The only other subject connected with injuries of the eye to which we shall allude is that of concussion of the retina, causing amaurosis, internal inflammation, and atrophy or shrinking of the globe. This often arises from injuries apparently trivial; but the serious consequences are known by the loss of sight, accompanied with dilated, irregular, and motionless pupil. These are followed by pain and inflammation of the organ. Absolute repose and antiphlogistic measures are indispensable to afford a chance of recovery, which may be expected to take place in slight cases where the loss of sight is only partial.

Chapter VII.—*Catarrhal Ophthalmia.*—This may be considered a very slight form of ophthalmia confined to the conjunctiva. It has been the subject of two opposite modes of treatment, which have both been employed with equal success. The one consisting of depletion and antiphlogistic remedies; the other stimulants, consisting chiefly of solutions of nitrate of silver and muriate of mercury. The former of these two modes of treatment is the one recommended by Mr Lawrence, the latter by Mr Melin, Dr Ridgeway, Beer, and Mackenzie. Probably this form of ophthalmia runs a regular course, like an influenza, consisting at first of an acute, and lastly of a subacute, or chronic, stage. The first of these being often of very short duration, the latter is probably the form in which it is generally seen by the surgeon. Mr Lawrence's short description of the disease fully confirms this explanation of it. "Stiffness and smarting," says Mr Lawrence, "some uneasiness on exposure to light, watering, and external redness usher in the attack. When fully developed, it is characterised by redness, and increased *mucous* not *lacrymal* discharge; the pain is inconsiderable, and there is no intolerance of light."—P. 152.—Hence, it may be inferred that, in many cases, very little treatment is necessary,—the disease runs its course, and the eyes get well, whether simple bathing or gentle antiphlogistic means are employed; in other cases, the treatment of the second stage, by the moderate use of stimulants, may be beneficial.

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* See his Compendium, p. 340.

Chapter VIII.—*Purulent Ophthalmia.*—This is certainly one of the most severe and destructive forms of acute inflammation of the eye, and hence it is one of the most important which can engage our attention. Mr Lawrence treats of it under three distinct forms; 1*st*, Purulent Ophthalmia of new born infants; 2*d*, Purulent Ophthalmia after infancy; and, 3*d*, Gonorrhœal Ophthalmia.

To Mr Lawrence's very able descriptions of the symptoms, progress, and treatment of this disease, we must refer our readers. The subject is too extensive for our limits, and we could not do justice to it in a condensed form. On a few important points, however, we shall state the opinions of Mr Lawrence.

In the purulent ophthalmia of infants, Mr Lawrence seems to have no doubt of the contact of leucorrhœal or gonorrhœal matter being the most frequent cause. But he also states, that in some cases the mothers are quite healthy, so far as we can ascertain; a circumstance which gives rise to dispute on this subject. Other circumstances, such as those which depress and weaken the system, may excite and aggravate this form of disease. The treatment of this ophthalmic affection recommended by Mr Lawrence consists at first of antiphlogistic means—afterwards astringents and stimulants, in the form of solutions of alum and nitrate of silver.

Chapter IX.—*Purulent Ophthalmia in the Adult.*—This is the important affection which has also received the name of

Egyptian Ophthalmia. Mr Lawrence gives a very interesting and concise history of this disease. In this he includes the earliest accounts of it on record, which all belong to the present century; the great extent and rapidity of its attacks where it prevailed; its very violent and destructive tendency to the eyes affected; the question as to contagion; and the mode of treatment. We cannot enter at length upon each of these; but as to the disputed question of contagion, we particularly recommend the remarks of Mr Lawrence. He has very candidly and fairly stated both sides of the question. There seems to be no reason to doubt that, in many situations, it has appeared to be contagious. In some cases it has existed without any communication with diseased individuals; and observations enough have been made to satisfy us that the matter from a diseased eye applied to a sound one may cause it. Mr Lawrence concludes by stating, "In practice, it is the safest course to proceed upon the notion of the complaint being contagious; and, acting upon that notion, to prohibit the use of the same sponges, utensils, or linen, or any other thing capable of communicating the disease from one to the other, just as if the contagious nature were decidedly proved."—P. 204.

The treatment of this disease requires the greatest activity and attention; at the very commencement, every exertion requires to be made to cut short the affection and save the eye, by arresting its progress before the inflammation has caused irreparable mischief to the delicate organization of the eye. This is to be done by a decided general blood-letting. In robust individuals, from thirty to sixty ounces require to be evacuated before the necessary effects are produced, which consist in relieving the pain and producing syncope. Local bleeding, blisters, the application of cold, &c. are afterwards to be resorted to. When the conjunctiva becomes paler, relaxed, and flabby, accompanied with abundant discharge, astringents, better diet, and tonic medicines are to be given. For this purpose solutions of alum, oxymuriate of mercury, sulphuric acid, acetate of copper, sulphate of copper nitrate of silver, and *Liquor Acetatis Plumbi* are to be used. Those which are mildest are to be used at first and made very weak; afterwards the stronger ones. If a granular state of the conjunctiva should remain, escharotics require to be cautiously applied.

We have now arrived at that chapter of the work which treats of Gonorrhœal Ophthalmia. Upon this subject, our readers will recollect we gave a full analysis of Mr Lawrence's separate work on the subject in the 34th volume of this Journal. It is unnecessary for us to enter again upon this subject, or the other Venereal affections of the eye; and of the numerous remaining subjects contained in the volume which is in our hands, we shall select only a few for comment.

Chapter XXVI.—*Malignant Affections of the Eye.*—Under this head Mr Lawrence includes cancer of the lower eyelid; fungoid and other growths from the eye not malignant; carcinoma of the eye; *fungus hæmatodes* of the eye, and melanosis of the eye. Into a minute description of these diseases we need not enter; and shall only briefly state the result of the experience of Mr Lawrence in the remedies for cancer and *fungus hæmatodes* of the eye. For cancer, or carcinomatous ulceration of the integuments of the eyelids or conjunctiva, to which it is in general, if not always, at first confined, excision he recommends as the proper remedy, and generally effectual. His conclusions respecting *fungus hæmatodes* are, "Our present experience warrants the conclusion, that the operation of extirpation would not be justifiable except in a very early period of the affection; and that its result even then would be doubtful.

"Mr Middlemore considers the disease to be an affection of the retina, confined in the first instance to that tunic, and strictly local: he therefore recommends removal of those parts only which are implicated in the mischief, as soon as the disease is detected, observing that they cannot be removed too soon. He states that "Mr Wardrop has recommended the excision of the entire organ, as being most likely to insure the patient's safety, on the presumption, probably, that a portion of the optic nerve ought to be removed as well as the retina: an operation so painful and so hazardous to the patient, (at that period of life, at least, when, to render it at all useful, it must be performed,) and so revolting to the feelings of friends, is not likely to be permitted; and as so extensive a removal of parts is, in many instances, unnecessary, I have thought it advisable to recommend merely a section of the cornea, (rather larger than that usually made in the operation of extraction,) and the evacuation of the humors, and the choroid and the retina; or, if the fungus be large and the cornea be small, the whole of it, (that is, the cornea,) and a portion of the surrounding sclerotica, may be taken away; an operation so little painful, and not at all dangerous, and by a skilful surgeon so easily performed, that it would require, in the majority of instances, very little rhetoric to recommend it to the majority of parents, who would at once refuse to allow the extirpation of the entire organ. It is only necessary to state to them that it will be less painful, dangerous, and disfiguring to their infant, than the continuance of the disease, to obtain generally their consent to the performance of an operation, which, at the outset of the malady, has all the advantages without the horrors of that usually had recourse to; and, if performed at a later period, does not preclude the extirpation of the eyeball, if that measure be deemed necessary.'

"It remains for future experience," says Mr L. "to decide on the merits of this proposal, which had not been reduced to practice at the time of its publication, and has not, so far as I know, been tried since. One objection to it is, that in some cases of the disease, the morbid growth has been found exterior to the globe, as well as within its cavity, even in an early period, and that the optic nerve has been found diseased, even in incipient cases. Again, in operations on malignant diseases, it is an imperative rule to remove not only all the altered structures, but some of the surrounding healthy parts; unless this is satisfactorily accomplished, the patient has not a chance of safety. How can we feel satisfied on this important point in such a mode of proceeding?

"The bare proposal of cutting out the eye is repugnant and almost revolting to the feelings of the surgeon and the patient's friends; and we could not think of subjecting a child to this frightful operation unless compelled by necessity, and encouraged by the certain prospect of benefit; unless fully convinced that the painful mutilation will not only remove or prevent suffering, but be effectual in preserving life.

"The operation is not, however, dangerous according to my experience. On the other hand, to cut away the front of the globe, and scoop out its contents, does not appear to me so completely free from all risk of unpleasant consequences, so slight and unobjectionable a proceeding as Mr Middlemore represents.

"The strong objections to an operation in cases of fungus hæmatodes, are, the circumstance of its having failed to save life in most, if not all, the instances in which it has been performed, and the spontaneous recovery of many patients, in whom the eye has presented appearances not distinguishable from those of fungus hæmatodes. (See page 617 to 620.) We are not, perhaps, warranted in concluding that an operation is hopeless in all cases of fungus hæmatodes affecting the eye-ball; it would, however, be justifiable only in a very early period of the affection. Complete removal of the orbital contents seems to me the only proceeding that offers even a chance of permanent cure, while in respect to pain and other immediate results, as well as to danger, it is not much more objectionable than the minor operation."—Pp. 624, 625.

Chapter XXIX.—*Diseases of the Lacrymal Organs.*—Mr L. does not appear to have seen any case of cancer of the lacrymal gland. He also states that Beer "never saw cancerous ulceration confined to the lacrymal gland." Both, however, describe an enlargement of the gland without evidence of malignity in its nature. A case of true cancer or carcinomatous ulcer of this gland has been delineated by Mr Watson in his Compendium of Diseases of the eye, edit. 3d. This case was operated on by another eminent surgeon of this city, who removed the eyelids and whole contents of the orbit, about three years ago. We have this very day, February 1834, (when writing this for the press) seen this case; and it now presents a frightful picture of extensive cancerous disease of the orbit, temple, and cheek, down to the mouth. There is a fungous mass projecting from the orbit, which bleeds sometimes. The skin surrounding the diseased parts is in a state of cancerous ulceration.

In cases of *Fistula Lacrymalis*, we find Mr L. gives a preference to the mode of cure proposed and practised by the late Mr Ware, viz. by the *metallic style* introduced into the lacrymal duct.

We now conclude our account of the contents of the able and interesting work of Mr L., earnestly recommending it to the perusal of every surgeon and every student of medicine.

Art. V.—*Cases illustrating and confirming the Remedial Power of the Inhalation of Iodine and Conium in Tubercular Phthisis, and various disordered states of the Lungs and Air-Passages.* By Sir Charles Scudamore, M. D., F. R. S., &c. Second Edition, considerably altered and enlarged. London, 1834. Pp. xxiii. and 227.

In the thirty-fifth volume of this Journal, the first edition of the work before us, together with four other treatises of different authors, on the treatment of consumption by the inhalation of iodine and other substances, was fully examined. On that occasion it was remarked, that, though the cases on which Sir Charles Scudamore founded his opinion of the sanability of phthisis were neither so numerous nor so accurately narrated as to be conclusive on the subject, a strong case was made out in favour of the palliative effects of iodine, and of the propriety of subjecting it to further and more accurate experiments.

During the three years which have since elapsed, Sir Charles has continued his observations; and in this new edition has appended a second series of eleven cases to the fifteen formerly published. To these new cases we mean now to confine our remarks, as the observations formerly made on the work itself are still applicable to it.

We have then three cases of tubercular *phthisis pulmonalis;* one of tubercles in the right lung; two of irritable cough; one of asthma; one of *bronchitis*, first acute and then chronic; one of chronic *bronchitis;* one of "a remarkably morbid condition of the bronchial membrane, in which there was strong evidence of ulceration;" and one of "cough of long standing, of a very spasmodic nature, attended with coloured expectoration."

Of the patients said to have been affected with tubercular *phthisis pulmonalis* and cured, the first is a lady, 32 years of age, the mother of a family. Her brother and sister had died of pulmonary consumption. Seven months before Sir Charles Scudamore was called in, she had caught cold, which was followed by a troublesome cough, hectic, emaciation, and debility. The medicines used had not given the slightest relief; and, when seen by Sir Charles, she appeared to be in a hopeless state. The pulse ranged from 120 to 130; the animal heat was 103; cough violent, and particularly harassing at night; expectoration to the amount of four ounces in the twenty-four hours, difficult, coloured with blood, of a very puriform appearance, and of a peculiar faint offensive odour. When viewed between plates of glass before a taper, it afforded a well-defined circle of different shades of orange, and an inner field of light-green. There were hectic, morning and evening accessions, profuse night perspirations uncontrolled by the free exhibition of the mineral acids, a foul tongue, great thirst, a loathing of food, and weak irregular digestion, without any signs, however, of a diseased state of the liver, or of tubercular irritation of the intestines. The urine was loaded with lateritious sediment; the catamenia had been suspended for six months; and the patient was so weak, that she had to be carried from her bed to a sofa in the adjoining room. She was much less sanguine in her expectations of recovery than consumptive patients usually are, and her mind was calm and resigned. The symptoms indicated by the stethoscope were on the right side, "pretty well-marked pectoriloquism, and strong *gargouillement;* and the respiration was evidently so imperfect, and the sound on percussion so dull, as to indicate great obstruction." On the left side, the symptoms were comparatively favourable, as regarded the voice, respiration, and the sound elicited by percussion.

In this condition Sir Charles Scudamore first saw her in the country in January. Inhalations of iodine and conium, sometimes with the addition of ipecacuanha, were prescribed along with medicines to allay the irritability and procure sleep. Sponging the chest with stimulating lotions, the use of the flesh-brush, and nutritious diet, were likewise enjoined. During the first fortnight a remarkable improvement was reported to have taken place. The patient, however, soon relapsed, notwithstanding which, on visiting her, Sir Charles thought that the case had assumed a better appearance, and the treatment was persevered in. After a temporary improvement she again relapsed; and in March was brought to town, and placed under the author's care. "It was manifest that there had been fresh softening of tubercles, indicated by increase of hectic fever, and of night perspirations,—by increase of expectoration, and its bloody and more puriform appearance, with an offensive odour, —by greater quickness of pulse,—and by a fresh loss of the newly-recovered flesh and strength." By inhalation of iodine, &c. counter-irritation, and the use of quinine, the aggravated symptoms subsided in a week. After several relapses, in which the fresh softening of tubercles was said to have been indicated, the patient, by the continued use of the iodine and conium inhalation, and attention to the general health, was so far restored by the end of May, as to be able to take an airing in a carriage when the day was favourable. The improvement still continuing, she was removed in July to the country, after which her progress towards health was almost uninterrupted; and, upwards of two years afterwards, Sir Charles had the satisfaction of seeing his patient "quite restored to health, strong and *embonpoint*," though prudently avoiding all exposures.

We have given this case at great length, as it is by far the most decided of those brought forward by the author. The other two cases we shall despatch more briefly.

The one was a gentleman, 30 years of age, of slight stature, but well-proportioned, of a delicate constitution, and nervous temperament. He had had three attacks of pleurisy. The general symptoms were by no means nearly so unfavourable as those of the case last-narrated; but "the stethoscope afforded signs of pectoriloquism to a small extent at the humeral extremity of the right clavicle, and the sound was dull all around this part of the chest. On the left side there was scarcely any morbid evidence." Sir Charles "thought, that, just at the superior part towards the shoulder, there was too much resonance of the voice; but, upon the whole," he "was well satisfied with the state of the left lung." After six months' treatment conducted on the author's usual plan, the pectoriloquism was exchanged for mere resonance; there was a better sound; and he had only an occasional cough. He went abroad on business; but, upwards of a year afterwards, "he lost his life at sea by an unfortunate accident."

The third case is entitled, "Tubercular *Phthisis Pulmonalis*,—pectoriloquism,—inhalation eminently successful."—"A young man, aged 22, tall and well-formed, with circular chest, having enjoyed from childhood general good health, though not considered strong in proportion to his rapid growth from 18 to 20, caught cold in the latter part of December 1832, while under the influence of mercurial medicine." The general symptoms of this case were not so severe as those of even the last; and we think the indications afforded by the stethoscope were any thing but decided.

But let Sir Charles speak for himself "On examination by the stethoscope and by percussion, I found that the disease existed chiefly in the right lung. Over a considerable extent of the upper part of the right side, the respiration was almost inaudible, and the sound dull. On the left side the indications were much more favourable. It appeared to me that the right lung was much obstructed by tubercles, and that the symptoms were indicative of the softening process having commenced."

Medicines were prescribed, for the purpose of allaying the irritability of the system. A blister was ordered to the chest, which produced remarkable languor and depression of strength; and leeches were applied occasionally to the right side of the chest with advantage. He began by inhaling a mixture of rose-water, tincture of conium, tincture of ipecacuanha, and hydrocyanic acid, which in a few days was changed for the iodine inhalation. After ten days of this treatment, the general symptoms were much alleviated; and "by the stethoscope, pectoriloquism was just perceptible, and the cough was slightly cavernous."—"As the disease proceeded, the pectoriloquism and the cavernous cough became very distinctly marked." For several weeks the patient was alternately better and worse; but after being nearly destroyed by epidemic influenza, he gradually recovered; and ten months after Sir Charles Scudamore first saw him, he was able to resume his occupation as a saddler. In a note, Sir Charles mentions that the epidemic influenza, which had nearly proved fatal to this patient, cut off two others, "a lady and a gentleman, whose cases were at first most unpromising, but who had so far improved as to inspire him with some hope, though certainly not with any confidence of eventual success."

On considering these details, the first reflection that suggests itself is the small number of the cases reported. It is not to be supposed for a moment, that a physician of Sir Charles Scudamore's standing should, in the course of three years, have it in his power to test the efficacy of his treatment in no more than five cases, two of which, and these the unfortunate ones, are despatched in a note of less than seven lines. Granting that the three cases above narrated were cases of true tubercular *phthisis pulmonalis*, they are much too few to justify the author's sanguine views. Moreover, we are entitled to infer, that in all probability the disease was merely suspended, not cured. This is manifestly the case, as far as regards the first patient. As to the second, no one can say what might have been the event; and in the third, that the disease is not overcome, is shown by the patient's being still affected with a cough in the mornings and slight expectoration retaining much of its puriform character. Well-marked pectoriloquism still remains "at the superior part of the right lung, and much dulness of sound over a great part of the right side. On the left side of the chest the signs may be pronounced favourable."

Sir Charles supposes "the cavity, which is still the source of pectoriloquism," to be cicatrized. But how does he account for the puriform expectoration? As the patient, however, is still using inhalations, wearing a plaster over the right side of the chest, and using "vinegar and water, with subsequent friction to other parts of the chest," we must consider him to be still under treatment.

Considering it to be but fair, that, in testing any plan of treatment, account should be taken of the unsuccessful as well as the successful cases, we feel disappointed at finding that those only which support the author's views are narrated. No detail is given of the two unfortunate cases, unceremoniously alluded to in a note; and if, as is highly probable, Sir Charles Scudamore has had many cases of *phthisis* under his care, why is no notice taken of any of them? The symptoms, general and local,—the medicinal agents,—the duration of the treatment,—and the result, might all be given in the columns of a table. It would also be satisfactory, in those cases which terminated unfavourably, to have an account of the state of the parts affected, as shown in the necropsy, where that could be obtained. In conclusion, we may be permitted to remark, that Sir Charles Scudamore appears to attribute too little of the benefit derived from his mode of treatment, to the various other medicinal and hygienic agents employed, to which it is obvious that much of the improvement was owing.

With a detail of the other cases, we think it unnecessary to occupy the reader's time. They all illustrate the principle, that many morbid states of the lungs and air-passages may be cured, or at least alleviated, by inhalation.

It is unnecessary to imagine, that in any of the foregoing remarks we have had the least intention of undervaluing the labours of Sir Charles Scudamore. On the contrary, they have all been dictated by the desire of seeing his views brought forward in an unobjectionable form, and by the wish that the subject should receive the fullest investigation,—and that, too, in the hands of one who, though not the originator of the plan, is at least the improver. Let him keep notes of all the cases of tubercular phthisis and other pectoral complaints which shall occur to him, and append them, in a tabular form, to the next edition of his treatise; and if this mode of proceeding should shake his faith in his plenary power of curing tubercular *phthisis pulmonalis*, even when the disease is confined to one lung, he will still have the satisfaction of having unequivocally established the probability of alleviating the severity, and perhaps arresting the progress even of this fatal malady; and of rescuing from destruction many who, in the despair of the efficacy of all treatment, might have been consigned to the grave.

Art. VI.—*Traité de la Vaccine et des Eruptions Varioleuses ou Varioliformes, &c.—A Treatise on Cow-pox and Variolous or Varioliform Eruptions.* By M. L. B. Bousquet, Chevalier of the Legion of Honour, &c. Paris, 1833. 8vo. Pp. xxiii. and 363.

M. Bousquet has for many years held a situation affording every facility for the investigation of the subject on which he has undertaken to write. For upwards of ten years he has, under the authority of the Royal Academy of Medicine, vaccinated gratuitously, twice a-week, the children of the city and various hospitals. From its being his duty to keep up a constant supply of vaccine matter, and to transmit it to the provinces and colonies when required, he has been led to maintain a constant correspondence with the medical men settled in the different departments, who naturally communicated to him the result of their experience; and thus the views given in the work before us rest not only on the authority and experience of M. Bousquet, but to a great extent on the observations of numbers of his brethren.

The origin of the work may be briefly explained. In 1828, in consequence of the small-pox raging at Marseilles, the Minister of the Interior called upon the Academy of Medicine to draw up such instructions as might point out the means of distinguishing *variola* from all the diseases assuming its appearance, and more especially the *varioloid.* As secretary to the vaccine board, M. Bousquet was intrusted with the task of answering this communication, and afterwards, with the approbation of the minister, drew up the treatise before us, which received the highest commendations from the committee of the Academy of Medicine, appointed to examine and report upon it.

The work consists of two parts. The first is devoted to the history of the discovery of vaccination—to a discussion of the circumstances under which, and the mode in which, it ought to be performed—the after-treatment of those vaccinated—the qualities of the vaccine virus—the manner of collecting and preserving it—the effects of cow-pox as to small-pox—the question of what influence the cow-pox has over the small-pox, when the two eruptions proceed together in the same patient—and the effects of cow-pox on the economy. The second part is devoted to observations on the natural and inoculated small-pox—chicken-pox, return of the small-pox after vaccination—the varioloid—the questions whether the vaccine matter has degenerated, and whether it be necessary to repeat the operation more than once, to secure the preservative effect of vaccination—the natural connection between small-pox and cow-pox, and the influence of vaccination on the population.

We shall pass over the first two chapters, which contain nothing of consequence, except a defence of the merits of Jenner, which we had conceived to be quite unnecessary in the present time, though, from what is mentioned by the author, it would appear not altogether superfluous in France.

Although small-pox very rarely attacks infants under six months, M. Bousquet recommends vaccination to be performed rather before than after that age, and without losing a moment if the epidemic be at hand. Vaccination will succeed at all seasons of the year, but spring being the time in which cow-pox and small-pox spontaneously occur, appears to be most favourable, and the disease generally proceeds better through all its stages. The experience, however, of the author and of some of his correspondents, has furnished some exceptions to this. In the spring of 1830, almost all the vaccinations failed. In the spring of 1831, the same phenomenon, with some variations, occurred, and some strange irregularities of the eruption appeared in April and May of the same year. From Saturday, 30th April, to May 7th, the cow-pox went on so rapidly, that the pustules appeared to be ten or eleven days old, though neither the child furnishing the virus, nor those receiving it, presented any thing remarkable. Only four were vaccinated, one a few days, and the other respectively one, two, and three months old. From this advanced looking matter five children were vaccinated. On the 14th, that is in eight days, four of these presented only two languishing pustules, while the fifth had four on each arm, as advanced as those from which the matter had been taken. On the 17th the pustules of the four first were so small and backward, as to appear scarcely five days old; there was no swelling, no areola. The pustules of the fifth were well characterised, and very regular. It was neither cold nor hot for the season, but alternately wet and dry. The same occurred in other places where the failure of the vaccinations was remarkable in July and August, though the children were vaccinated with virus taken directly from the arm.

Though it is commonly supposed that heat hastens, and cold retards, the developement of the pustules, there are facts which show that their power is limited. In 1821 and 1822, M. Ives, a physician of Mont Lucon, vaccinated during the month of August, in the middle of a sultry day, twelve children, none of whom were affected, while twelve others vaccinated the same day at eight o'clock in the evening, with the same matter, took the infection. A similar want of success attends vaccination in equatorial countries, so that out of twenty or thirty patients, there will not perhaps be more than two or three pustules, and hence the vaccine virus is often lost. M. Bousquet attributes this not to the virus being decomposed by the heat, which could hardly occur when the matter is taken directly from the arm, but to the condition of the skin; but if a fact be well ascertained, the theory is of less consequence.

M. Bousquet justly considers it useless to subject the patient to any preparatory treatment before vaccination, because we are altogether ignorant of the circumstances which prevent the success of the operation, and though we did know that there was a peculiar constitution which could resist the influence of the virus, we are not aware of any treatment which could modify it. It is needless to expose the absurdity of the means which have been used in such cases, such as baths to relax the skin, evacuants to promote absorption, &c. In this country, they have now, we believe, no supporters, and few we should think even among the theorists of the continent. A shorter and surer mode of attaining the end in view is to repeat the operation again and again, till it succeeds; trusting that either by change of the organization or season, or by renewed applications, the virus may be at last absorbed and produce its constitutional effects.

M. Bousquet passes in review the various modes of performing vaccination, and attributes more to the hand that performs it, than to the instrument or manner of operating. He does not believe that it is of any consequence whether the blood flow or not, as his experience leads him to believe that it has no power to wash away the virus. One vesicle he conceives to be as good as several, though, for the sake of keeping up the supply of matter, he is in the habit of inserting the virus into one or two different places. When this plan is followed, the incisions or punctures ought to be at some distance from each other. The author is of opinion, that the matter is absorbed with great rapidity, so that there is no fear of the dress wiping it off. This is confirmed by some experiments made in his presence by M. Itard. The moment that the punctures were made, they were in some instances washed with water, in others with a solution of sal-ammoniac, and in others with chloruret of soda, without any effect. The pustules appeared at the ordinary time, as if nothing had been done to prevent the developement. The experiment was carried still farther. A cupping-glass was applied, the skin was puffed up, the blood flowed in abundance, yet the result was the same. But, however easy and prompt absorption may be in infants, it is not the same in adults. According to the treatise before us, it is seldom that vaccination succeeds the first time, in a young man, and *a fortiori* still less so in an old man. It must be repeated frequently, as it would appear that the reiterated introduction of the virus prepares the system, by creating a predisposition to receive it. M. Bousquet concludes that there are in reality very few who obstinately resist the influence of cow-pox, and that, if all those cases which are said to be proof against its virus, were carefully inquired into, it would be found that a great majority of them had been affected with small-pox, either in the womb, of which some instances are on record, or without their parents being aware of it, which might easily happen while the children were with their foster-mothers. In this country, however, few on these accounts could be deducted from those who are said to resist vaccination. Still the number is very small, and we agree with the author, that such individuals are as little liable to small-pox as to cow-pox.

Besides the irregularities referrible to seasons and temperature, there are others which demand attention. The period of incubation, which ordinarily lasts three or four days, has been found by M. Bousquet to be prolonged to the 7th, 8th, 10th, 15th, 17th, and even 30th day. He has heard of instances still more extraordinary, of which he is justly very sceptical. Sometimes, after waiting in vain for the eruption, a second vaccination is determined on. This gives a new impulse to the former, which is then developed with the latter, by as many vesicles as there were punctures. Sometimes, instead of being slower in coming to maturity, it is too quick, and that without any increase of temperature to account for it.

M. Bousquet has also met with a difference in the progress and developement of the pustules, so that some are completed when others are only beginning. A still more extraordinary fact has been observed by him. The cow-pox, after having gone through all its stages, and reached the last, has again revived, and gone over the same course again. Lastly, despite the antipathy which appears to exist between the cow-pox and small-pox, the two eruptions go on together as if each was alone,—a fact which it is of consequence to remember. To these may be added another irregularity which occurs very seldom. It is well known that cow-pox in general confines itself to the place of vaccination, yet there are instances when supernumerary pustules appear on different parts of the body. These anomalies have not been found by M. Bousquet to affect the essential properties of the cow-pox, which is as good, useful, and preservative, as when it is regular in all its phases.

M. Bousquet, rejecting as absurd the division of false cow-pox into different varieties, recognizes only one species, of which we abridge his description. Though the degenerate produce of the true, it has neither the same progress, form, nor duration, and, consequently, is not a preservative against small-pox. While true cow-pox scarcely appears at the end of the third day, or commencement of the fourth, the false, much more precocious, shows itself from the first to the second day, and proceeds with such rapidity, that it is fully developed when the true is only beginning to appear. Besides these palpable differences, which alone would be sufficient always to distinguish them, false cow-pox has a progress and form peculiar to itself. There is no central depression,—no silvery lustre,—no hard areola. The vesicle rises rapidly and sharply. Its summit is crowned with a yellowish reflexion, bursts, and allows a drop of yellow matter to escape, which, when dried, has some resemblance to gum. If the structure of a false vesicle be examined, it will be found to have no resemblance to that of a true one, for it is situate more superficially, and has only one cavity.

M. Bousquet maintains, that the false cow-pox is the produce of the true, and approves of none of the explanations which have been given of its cause.

We pass over the next five chapters, from which it appears, that M. Bousquet considers the vaccine matter to retain all its powers till the 18th or 19th day,—that the younger the matter, and the less there is of it, the more active it is, and that, consequently, adults should be vaccinated from young infants,—that the virus cannot be contaminated by any disease or constitutional defect, and, consequently, that neither scrofula, nor any thing but cow-pox, can be communicated from one child to another by vaccination,—that it is impossible, by cautery or any other process, to prevent constitutional effects of the virus, when once it has been inserted into the body,—that its antivariolous effects are incontestible,—and that the best mode of preserving it is that adopted in England, of receiving it on small squares of glass, and wrapping it in tinfoil.

The fourteenth chapter, on the question whether the cow-pox has any effect on small-pox when they proceed together, merits more attention. In this part, several facts are brought forward to prove, that, though cow-pox may exist simultaneously with small-pox, it does not render it milder. The author begins his remarks by observing, that the small-pox does not kill above one in nine or ten of those whom it attacks, and that, consequently, where vaccination has been practised at the commencement of the disease, it gets the credit of saving the patient, although he would have been saved without it. He then cites the case of a child of one of the members of the Academy of Medicine, and fifteen other cases of patients, who lost their lives in 1829 during the epidemic at Marseilles, though cow-pox was in the act of being developed at the same time. These cases are not isolated, but occurred in one and the same epidemic, and therefore of material consequence in determining the dispute. But the question occurs, how can a disease powerful enough to prevent another be unable to soothe or mitigate that other. M. Bousquet replies that such a reflection implies a false notion of cow-pox. On this system it is believed that vaccination corrects and destroys the aptitude for small-pox, by impressing on the constitution a modification in an inverse sense of this aptitude,—that there exists between these two eruptions precisely the same opposition which exists in chemistry between two bodies which neutralise each other, or in medicine between a disease and its specific. But, considered in themselves, the vaccine virus and the variolous virus destroy each other so little, that if we mix them together, and inoculate with this mixture, there result two eruptions perfectly distinct, corresponding to their double origin, and nothing more. Considered in their effects it cannot be said that vaccination cures the small-pox, nor, strictly speaking, can it be said to prevent it. It merely takes its place, and stands instead of it—it is a substitute, and nothing more. Thus far from accounting for the effects of vaccination by the opposition which it is supposed to have to small-pox, he explains them by the analogy which he supposes to unite them, and by the bond which causes every thing to be reciprocal between them. We confess that we do not clearly understand all this, and that we suspect M. Bousquet here of a little mystification. It is, however, a question more curious than useful, as, if the cow-pox *does not* mitigate, it at least does not aggravate the disease, and we conceive that we have done all that is required of us, in laying before the reader an abstract of the author's reasoning.

In the succeeding chapter, M. Bousquet shows that, with the exception of diminished liability to small-pox, vaccination leaves the system in the same state as it found it, and that, consequently, the treatment formerly adopted in this country, and still adhered to in various parts of the continent, is altogether useless.

The second part we cannot, for want of space, enter minutely into. We shall therefore confine ourselves to giving a brief abstract of the author's opinions regarding the supposed degeneracy of vaccine matter, and the necessity or prudence of vaccinating the same individual more than once.

So long as it was believed that vaccination was an infallible preventive of small-pox, no one ever supposed that the vaccine virus had degenerated. But no sooner was it discovered that it sometimes failed in its effects, than the cry was raised of its degeneracy. This view of the subject M. Bousquet considers to be absurd, and examines the conclusiveness of some experiments made by M. Rigot in 1824, which seemed to favour the opinion which he combats. To the validity of the experiment of M. Fiard, who failed in his attempt to vaccinate a number of cows, he raises the objection, that the experiment may have been tried on cows which had already had the disease, or which were not predisposed to it; in both of which cases it would have been fruitless. Another objection also is stated, that though a virus peculiar to a species may be easily communicated to any individual of that species, it is a different thing when it is attempted to be communicated to another. This is shown in cow-pox being communicated to a herd if one be affected, though it has no effect on man, unless it be applied to the open mouths of the absorbents. After passing in review the experiments, reasonings, and observations of Wolde, Gregory, Brisset, Honorat, Robert, &c. he comes to the conclusion, that the virus is as active as it was in the days of Jenner, and as much to be trusted. Into the question of the necessity or prudence of vaccinating an individual more than once, M. Bousquet enters at considerable length, and after examining the reasonings of those who have discussed the subject, comes to the conclusion, that it is neither necessary nor prudent. He acknowledges that the older the vaccination is, the less is its power as a preventive against small-pox, but he contends, that, this being a disease of infancy, the older a person becomes, the less predisposed he is to it. He considers the effect of pustules occurring on individuals vaccinated a second time by accident or design to be altogether local, and to communicate no change to the constitution. We regret that our limits will not permit us to give the author's reasoning on this and other interesting points. We must be content to refer the reader to the work, which, though containing much that has been long known, will amply repay him for the trouble of perusing it. All the disputed questions regarding cow-pox and its effects on small-pox, he will find discussed under separate heads in a spirit of candour and liberality. The book throughout exhibits an anxious desire on the part of the author to arrive at strong and just conclusions, and forms a contrast to the many treatises, which, both in this country and on the continent, issue daily from the press, to support the prejudices or partial views of their authors.

ART. VII.—1. *Histoire Abrégée des Drogues Simples.* Par N. J. B. G. GUIBOURT, &c. Paris, 1826.

2. *Dictionnaire des Drogues Simples et Composées, ou Dictionnaire D'Histoire Naturelle Médicale de Pharmacologie et de Chimie Pharmaceutique.* Par A. CHEVALLIER et A. RICHARD, &c. Paris, 1827.

3. *Cours D'Histoire Naturelle Pharmaceutique ou Histoires des Substances usitées, dans la Therapeutique, les Arts, et l'Economie Domestique.* Par A. L. A. Fee, Pharmacien, &c. Deux Tomes. Paris, 1828. 8vo.
4. *Dictionnaire Universel de Matière Médicale et de Thérapeutique Générale, &c.* Par F. V. Merat et A. J. De Lens, &c. Paris, 1829.
5. *A Manual of Materia Medica and Pharmacy, comprising a concise Description of the Articles used in Medicine; from the French of H. M. Edwards, M. D. and P. Vavasseur, M. D.* Corrected and Adapted to British Practice by John Davies, M. R. C. S. Lond. 1831.
6. *A Supplement to the Pharmacopœia, and Treatise on Pharmacology in General; including not only the Drugs and Preparations used by Practitioners of Medicine, but also most of those employed in the Chemical Arts, &c.* By Samuel Frederick Gray. London, 1831.
7. *A System of Materia Medica and Pharmacy, including Translations of the Edinburgh, London, and Dublin Pharmacopœias.* By John Murray, M. D., &c. Sixth Edition. Adapted to the present State of Chemical and Medical Science, by John Murray, M. D., &c. Edin. 1832. 8vo. Pp. 886.
8. *Elements of Materia Medica and Therapeutics, including the Recent Discoveries and Analyses of Medicines.* By Anthony Todd Thomson, M. D., F. L. S., and G. S., Professor of Materia Medica and Therapeutics, and of Medical Jurisprudence in the University of London, &c. &c. Vol. i. 1832, 8vo. pp. 747, Vol. ii. 1833, pp. 694.

GREAT as were the improvements introduced into medical science, and the revolutions effected in medical theory and practice by the writings of Cullen, we doubt whether they were in any department more remarkable, more valuable, or more beneficial, than in that of Materia Medica and the general principles of Therapeutics. Previous to his time, indeed, there seemed to be scarcely any necessary connection between Pathology and Therapeutics; and while the former was but a collection of fanciful conjectures, and unfounded or gratuitous hypotheses, the latter seldom aimed at anything else than the repetition of a series of random and empirical rules, irrational or inert applications, and not unfrequently, superstitious observances.

From these degrading marks of an ignorant and illiberal taste the doctrines of Cullen suddenly and immediately rescued the department of Materia Medica; and so great and effectual was the change, that, while it is almost superfluous to ascend higher than the era of the publication of even the surreptitious copy of the Lectures of this Physician, for correct views on Materia Medica and Medical Therapeutics, it is certain that the complete system published by that author in 1789 forms the basis of the most important improvements which these sciences have undergone. By shunning the errors of his predecessors, and many of his foreign contemporaries, and by exercising a judicious spirit of selection, scepticism, and sound criticism, Cullen was enabled to present a treatise on the Materia Medica, not only more complete and systematic than had been hitherto given, but of infinitely greater practical utility. It accordingly continued long to occupy a prominent place in the library of the physician, and still possesses so great value that no one who wishes to understand the connection between Pathology and Therapeutics, can dispense with the diligent perusal of that work.

With all its merits, however, the treatise of Cullen was liable to certain objections, the force of which necessarily increased with the progressive lapse of years and the advancement of science. From being published at the same time at which the extensive and valuable *Apparatus Medicaminum* of Professor Murray of Upsala was in the course of publication, the Edinburgh lecturer could not avail himself to the full extent of the researches and precise results of the Swedish professor.

A still more serious objection was the disregard avowed and expressed by Cullen, of the aids of chemical analysis in illustrating either the physiological or the therapeutic powers of medicinal agents. Though this disregard might be excusable at a period when general chemistry was almost in its infancy, and when the analysis of organic bodies was not only imperfect but positively erroneous, and Cullen perhaps acted wisely in this particular instance in not burdening his work with information of questionable merit, it is impossible to doubt, that, as a general principle, such disregard of the chemical constitution of medicines and drugs is not justified either upon rational principles, or by the subsequent history of Materia Medica and Pharmacy.

The whole of the doctrines of Cullen were reproduced in a more condensed and tangible form, and consequently more adapted for general use, by Dr James Gregory, Professor of the Institutions of Medicine, in the second part of his *Conspectus* of Theoretical Medicine, first published in 1782, and afterwards improved in several successive editions.

The objection to the treatise of Cullen, derived from the neglect of chemical analysis, was completely obviated by Dr Duncan Junior, in 1803, by the publication of his Dispensatory, in the first part of which, the chemical history and analyses of all the simple substances used in the Materia Medica were most accurately given, according to the improved principles of modern chemistry; and in the second part of which, the processes for preparing the chemical medicines and the pharmaceutical combinations were accurately described and explained, and their merits examined, according to the lights afforded by chemical pharmacy. The convenient form for consultation in which this work was published, its compendious shape, and the general precision of its information, especially in chemistry and chemical pharmacy, quickly raised it to the highest rank as a system of practical Materia Medica and Pharmacy; and it is no exaggeration to say, that its circulation has been incalculably more extensive than that of any other treatise on the same subject.

In the numerous editions which followed each other in rapid succession for nearly thirty years, the indefatigable author made a point of introducing all the recent improvements, and all the most accurate information in Natural History, Botany, and Chemistry, and thus kept the sciences of Materia Medica and Pharmacy always at a level with the progressive improvement of its constituent elements. In the later editions of this work, Dr Duncan improved very much, from practical experience, the therapeutical details, and the rules for the appropriate application of certain remedies to particular diseases and morbid states. The twelfth or last edition of this work, published some time before the death of the author, may be regarded as the most complete and useful body of instruction in Materia Medica and Pharmacy yet published, by the immense quantity of accurate information which is condensed into a very small compass.

Upon a plan somewhat different, and more in imitation of the method of Cullen, the same task was undertaken, and the same defects were ably supplied in 1804 by Murray, whose Elements of Materia Medica and Pharmacy exhibited a very happy specimen of the combination of correct physiological and chemical knowledge with therapeutical principles, in communicating just views of the physiological and therapeutic effects of the various agents employed in the treatment of diseases, and which, for a long series of years, continued to be regarded as the most scientific and useful compendium on that subject.

Of this Treatise three editions were published during the lifetime of the author, in which Dr Murray, by his successive improvements, additions, and rectifications, kept his Elements always on a level with the advancement of physical and chemical science generally, and medical science in particular. Since the death of the author, three editions have also been published by his son, the last of which is at present before us. Dr Murray has evidently taken considerable pains to sustain the high reputation of the work of his father. He has done wisely in observing the general arrangement of the original work, and in confining himself simply to the introduction of such improvements and additions, as the progressive advancement of chemical and medical science have necessarily effected in pharmacy and the preparation and administration of medicines.

In the year 1797 appeared anonymously the first part of a volume, of which Dr Richard Pearson of Birmingham avowed himself to be the author, by publishing the whole work in a more complete and revised form in 1808. This treatise, entitled a *Practical Synopsis of the Materia Alimentaria and Materia Medica*, which is, accordingly, divided into two parts, is remarkable for giving a short and compendious, but clear and useful, view of the dietetic and nutritious properties of the various articles of food and drink, and of the physiological and therapeutic effects of the medicinal agents employed in the cure of diseases, as these effects were ascertained by the experience of the most able and credible observers. In ascertaining the weight of evidence on the latter point, Dr Pearson appears to have held the balance with a steady hand, and estimated its oscillations with an accurate eye. He has introduced much valuable information from Murray of Upsala, and all the important materials which had been collected, during the experience of nearly forty years, by the most eminent English and foreign clinical practitioners and experimentalists. He has even referred, for the most important facts, to the best original inquiries, and the most able monographs; and his work not only presents a comprehensive and just view of the state of the science of *Materia Medica* in 1808, but constitutes almost a digest of the literature and annals of the art.

Dr Pearson has often differed from Cullen in the degree of confidence which is to be reposed in various remedies. Some medicinal agents which that author had appreciated too highly, he has reduced to a more humble rank; others, which Cullen has unjustly depreciated, he has had occasion to raise to a more just value. In these changes he has been guided both by personal observation, and by the concurrent testimony of many respectable observers.

For a long series of years the profession in this country appear to have been perfectly satisfied with the successive editions of the Elements of Dr Murray, and the Dispensatory of Dr Duncan; and the regularity with which new and improved editions of the latter work issued from the press, superseded, in a great degree, the necessity of any other publication.

While the works now mentioned were the chief guides on Materia Medica, Therapeutics, and Pharmacy, in this country, treatises, of various degrees of merit, began during the same period to appear on the continent.

Next to the treatises of Swediaur and Schlegel (1793), the first work which deserves particular mention appeared in Italy, in which Brugnatelli published in 1807, under the name of *Farmacopea Generale*, a treatise on Materia Medica and Pharmacy, which was deemed worthy of being translated into French, and published at Paris in 1811. The favourable reception accorded to this work induced the author to publish in 1814 a new and more complete edition, in three volumes, with the addition in 1817 of a valuable compendious system of Materia Medica, adapted to the *Pharmacopæia*, and both of which combined exhibited a very full and excellent view of the state of knowledge on these subjects at that period.

In this work we cannot help thinking that the Italian physician appears to greater advantage than almost any of the writers either of the same time, or for several years after, especially on the continent. The work of Brugnatelli evinces more method in the general arrangement of the materials, more precision and nicety in the admission of facts, more philosophical accuracy, and a greater degree of discrimination throughout, than we can recognize for several years afterwards in the treatises which appeared on this subject. *

In 1805 Schwilgué published a treatise on Materia Medica, which contained a fair view of the repetition of the doctrines of Cullen and Murray, with occasional portions of information from Duncan. †

This work appears to have been very much esteemed; for though the author died in 1808, before he was capable of publishing a new edition, this was done from the materials left by M. Nysten in 1809. Nysten was cut off by apoplectic seizure in 1818, while he was engaged in the completion of the third edition, which is certainly the state in which the work is now to be considered as a treatise on Materia Medica.

The work of Schwilgué, thus improved, consists of two parts. The first is, indeed, a system of pharmacology, giving short sketches of the natural, physical, and chemical history of medicines, with their pharmacological preparations and uses; the second, denominated a Clinical Pharmacopœia, exhibits more complete views of the pharmacological history of the different agents employed in the treatment of disease, with good accounts of their physiological effects, and their therapeutic powers.

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* Farmacopea Generale, Ossia Dizionario delle Preparazioni Farmaceutico-Mediche piu usitate ai nostri tempi, &c. Nuova Edizione Riveduta dall autore e notabilmente accresciuta. Aggiuntovi La Materia Medica Di L. V. Brugnatelli, Membro, &c. Tome iii. Pavia, 1814 et 1817.

† C. J. A. Schwilgué, Traité de Matière Medicale, Deux Tomes, 8vo. Paris, 1818.

This treatise is entitled to considerable attention from the philosophical character of the views given on the operations of medicines, and from the general spirit of accuracy with which it is pervaded.

We think, nevertheless, we can recognize many characters of resemblance both in doctrine and practical points between it and the second part of the *Conspectus* of the late Dr James Gregory of the University of Edinburgh; and are therefore disposed to infer that Schwilgué or perhaps Nysten, availed himself of the doctrines of Cullen and Gregory, or drew occasionally from the same sources from which the latter derived his information.

In the year 1817, M. Alibert, already distinguished by the publication of various useful works, published under the name of New Elements of Therapeutics and Materia Medica, one of the most complete systems which his countrymen had yet seen. In this work, in which the author introduced all the recent facts afforded by the extending sciences of natural history and chemistry in illustration of Materia Medica and Therapeutics, M. Alibert presents not only full and in general instructive views of the theory of the operation of medicinal agents, but he gives a most complete description of each remedial substance, under the several heads of its natural history, its physical properties, its chemical properties, its medicinal properties, and the mode of its administration.

The general arrangement of M. Alibert is founded on the distinction of the different functions. He treats successively of remedies which act on the functions of assimilation, of those which act on the functions of relation, and of those which act on the functions of reproduction.*

Our attention is next directed to Italy, where, in 1821, Targioni Tozzetti, Professor of Botany and Materia Medica at Florence, published, in the form of lectures, a useful and in general accurate compendium of information on the latter subject. The pretensions of this work, indeed, are not very high; and though in many points meagre and rather scanty, it exhibits a sketch not uninstructive of the therapeutic agents which the physician employs in the treatment of disease.*

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* Nouveaux Elemens de Therapeutique et Matière Medicale, par J. L. Alibert, 4ième edition, ii. Tome. Paris, 1817.

A still more complete treatise on this subject than either of the two former was published by M. Barbier of Amiens in 1824. In this treatise we can recognise a gradual improvement from those of Schwilgué and Alibert, and a more complete approximation to an extended scientific view of the medicinal agents employed in the cure and alleviation of diseases. After some judicious observations on the physiological action of medicines on the living frame, and their effects on the different tissues and organs, M. Barbier gives a full and pretty just view of the general effects of medicines, then considers their therapeutic influence, or that which tends to allay or subdue morbid, and restore healthy action, and concludes this preliminary sketch with a short view of the best mode of classifying medicines according to their pharmacological properties and relations.

His classification does not materially differ from that of Cullen, Murray, and Pearson.

In the subsequent part of the work he gives full and accurate accounts of the natural history, the physical and chemical properties, the pharmaceutical preparations, and the physiological and therapeutic effects of the different substances employed in the practice of medicine and surgery. M. Barbier even gives pretty full details upon the effects of hyperdynamic or poisonous doses of various medicinal agents. The work forms altogether a valuable and instructive system.

The great work of Pfaff, the Professor of the University of Kiel, which was completed in the same year, has been already noticed in the 26th volume of this Journal.

Since the publication of the treatises of Barbier and Pfaff, several works on Materia Medica and Pharmacy have issued from the press in France and Germany, and in America.

The Abridged History of Simple Drugs by M. Guibourt is an interesting and instructive performance. The author follows the method of Natural History in dividing his subject into three parts, which are treated in an equal number of books,—the mineral, the vegetable, and the animal substances employed as medicinal agents. Under these heads, with their numerous subdivisions, M. Guibourt describes with great fidelity and accuracy the various simple substances employed in pharmacy and therapeutics.

The Manual of Materia Medica and Pharmacy by Drs H. M. Edwards and Vavasseur forms a very convenient compendium, which presents short but generally just views of the physical, chemical, physiological, and therapeutic qualities of the various medicinal agents.

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* Lezioni de Materia Medica del Dotta Ottaviano Targioni Tozzetti, Professore di Botanica e Materia Medica, Ferenze, 1821, 8vo.

The authors, in despair of forming a methodical arrangement of medicinal agents quite unobjectionable, have adopted a classification which is formed partly on chemical, partly on physiological properties, and partly on general effects. Thus they have distinguished them according to the primary effects of their action on the body, into 1. Caustics; 2. Rubefacients and Epipastics; 3. Astringents; 4. Tonics; 5. Stimulants or Excitants, general and special; 6. Narcotics; 7. Emetics; 8. Purgatives; 9. Laxatives; 10. Temperants; 11. Emollients; and 12. Anthelmintics.

It is easy to see that this arrangement is equally liable to objection as any other; and every one familiar with the mode of considering the operation of external or physical agents on the human body must perceive that the class of special stimulant medicines ought to comprise not only diuretics, sudorifics, emmenagogues, and expectorants, as in the present system, but that of purgatives and laxatives, and emetics and anthelmintics.

The work, which is nevertheless valuable, has been well translated and adapted to the uses of the English reader by Mr Davies.

One of the ablest foreign treatises is that of M. Fée, Pharmacien and Demonstrator at the Military Hospital of Lille, and Professor of Pharmaceutical Natural History and Botany in that city. Without disputing about the appellations which he applies to the science, (*Materia Pharmaceutica, and Pharmacographie,*) we may say that this treatise is one of the most complete within its limits, and the most precise on Materia Medica.

The method of arrangement is entirely that of Natural History. Distinguishing the whole of the substances used in the Materia Medica, as they are products of the organic or inorganic world, he considers, *first*, the substances obtained from the bodies of animals, either entire or in part, or secretions; *secondly*, the substances furnished by plants; and *thirdly*, the substances obtained from minerals used for the purpose of curing disease.

In the particular history of each medicinal agent, M. Fée enumerates and describes the following particulars categorically; 1. the synonym, modern, ancient, and popular; 2. the characteristic denomination and *habitat* of the object by which the medicine is furnished; 3. the description of the medicinal agent; 4. its sensible characters; 5. the operation of time and of cultivation; 6. adulterations, substitutions, and alterations; 7. the chemical properties, as determined by analysis; 8. its use in pharmacy, in economy, and in the arts; 9. cultivation; 10. its importance as a commercial article; 11. the historical notices; and 12. the etymology of the name.

To this order M. Fée has adhered, in general with great accuracy; and he has consequently succeeded in giving a more precise and instructive history, physical, chemical, pharmaceutical, and therapeutical, of the various articles contained in the *Materia Medica*, than any other individual has been capable of doing.

It is further proper to mention, that, under the respective heads of each separate article, he has given short and accurate accounts of the various new proximate principles which chemistry has been enabled to prepare from them. In this manner he has described such substances as the sulphate of quinine, morphia, emetine, picrotoxine, veratria, asparagin, and the other vegetable or animal principles.

When speaking of works of this kind it would be hardly proper to omit the two extensive and elaborate dictionaries which have, during the last six years, issued from the French press.

The first of these, the Dictionary of Simple and Compound Drugs, or the Dictionary of Medical Natural History, Pharmacology, and Pharmaceutical Chemistry, began to be published in 1827, by MM. Chevallier and Richard, and was completed in 1829, in five octavo volumes, by these gentlemen in conjunction with M. Guillemin. Its arrangement is entirely alphabetical; and though in this respect scientific method be to a certain extent sacrificed, in the general construction of the work, in the description of particular articles simplicity and precision, as well as great extent of information, are conspicuous; and the work is well adapted for facility of consultation. This work is, indeed, so excellent that we should have regarded it as perfect, were we not compelled to admit, that, with all its merits, it is in some respects exceeded by a similar work, which has, during the same period nearly, issued from the same press.

The Universal Dictionary of Materia Medica and General Therapeutics, by MM. F. V. Merat, and A. J. De Lens, began to be published in 1829; and the fifth volume, which is the last we have seen, appeared in 1833. Another volume completes the work.

The volumes of this extensive publication we have had frequent occasion to consult during the course of their appearance; and many of the articles we have perused with greater or less degrees of attention. So far as upon this experimental trial it is competent for us to form a judgment, we feel that it is just to say that the Dictionary of MM. Merat and De Lens is the most perfect treatise now extant on the subject of Materia Medica and general therapeutics. The descriptions of the different articles are given with great precision and accuracy; the botanical nomenclature and distinctions are given according to the best authorities; the most recent and best information on their chemical analysis and constitution is communicated; the information in pharmarcology is accurate and rational; and the details of general therapeutics are clear, methodical, and comprehensive.

In both works we find pretty ample details on mineral waters, their respective composition, the diseases in which they are beneficial, and the restrictions and conditions under which they should be used.

In short, so complete and comprehensive, and, on the whole, so accurate, are both of these works, that, while we have much difficulty in deciding which is the preferable, we are confident that the student and practitioner who peruses either must have the means of learning every thing that he requires to know on the subject of Materia Medica and Therapeutics.

We must further add, that both works exhibit a most laudable determination to repel a charge too often very justly urged against the writings of the French authors, and to which continental authors have been more liable in the case of Materia Medica and Therapeutics than in any other department of Medicine. We know that it is neither egotism nor arrogance to assert, that in accurate and useful information on these subjects, the writers of this island have always appeared pre-eminent, and have conferred more important benefits on the mere practice of the healing art, than have been done by the physicians of the other European countries; and we think, that, when the clinical experiments of Home, Dawson, Fowler, Haygarth, Currie, Beddoes, Withering, Bardsley, Manson, and a multitude of others of inferior note are considered, it will be regarded as no extravagant assertion to say, that without these Materia Medica and Therapeutics must have been a vague, uncertain, and confused assemblage of materials, without method or precision, and without efficiency or adaptation.

We confess that we have often remarked in the foreign authors a degree of ignorance of English experimental inquiries and disregard of their results, which we could not have contemplated in persons professing interest in the advancement of medicine; and while English physicians were solicitous to receive, with gratitude and deference, from their continental brethren, the most slender portions of their physiological and pathological inquiries, the latter seemed to imagine, that, as the English were their pupils in these departments, they were not qualified to be instructors in others.

We are happy to perceive in the present works proofs of a change of opinion on these points. In the Dictionary of MM.

Merat and De Lens, most minute attention is devoted to the clinical experiments of the foreign authors generally, and those of the English in particular. In both works we observe great attention to the proper notice of the several authorities; and in the Dictionary of MM. Merat and De Lens, to each article is appended a copious list of the different monographs which have been published on each subject, and of the general treatises or essays in which the merits and virtues of each are more or less extensively discussed.

In treatises so voluminous, it is unreasonable to expect perfect accuracy in the relation of the different authorities; and perhaps many mistakes are committed from various causes. Some of these we have observed to be ludicrous enough, and others to indicate that imperfect and inadequate knowledge of English literature which we so frequently observe in French authors. On one of these points, we beg to inform MM. Merat and De Lens, that not Mr John Young, who writes on Indigenous Opium in the first volume of the Edinburgh Philosophical Journal, but Mr Arthur Young, is *le celebre agronome*; and that the two are quite different persons, the one being a Scottish surgeon, the other an English farmer.

The Supplement to the Pharmacopœia by Mr Samuel Frederic Gray is a performance neither without merit nor utility; and though neither its pretensions, nor the arrangement and nature of its materials, allow it to be placed on a level with the works already mentioned in this sketch, yet the extensive and multiplied character of its information must render it a great acquisition to the pharmacological student.

Its arrangement and its materials are entirely and exclusively pharmacological. It may be represented to be a classification of all those agents which, whether simple or compound, separate or combined, in the crude state, or in various forms of preparation, are employed not only for the cure of diseases in the human subject, but for the removal of those occurring in the lower animals, and also for a great number of purposes in the arts.

Such a work cannot be expected to be either minute in its details, or copious in information. Whatever is given, however, appears to be in general accurate, and the author has been studious to communicate a large proportion of useful instruction in a small compass. Another object which Mr Gray has had in view is to render his supplement a sort of Universal Price Current. He has given the usual rates at which almost all substances used either by the physician, the surgeon, the apothecary, the chemist, the druggist, the painter, the varnisher, the dyer, the carpenter, and even the cook and confectioner are in the habit of using.

The work consists of fourteen separate parts, in each of which he enumerates under the following heads, whatever substances are employed for any of the purposes now mentioned,—1. vegetables; 2. animals; 3. compound combustibles; 4. oily compound combustibles; 5. simple combustibles; 6. metallic bodies and their salts; 7. earthy and alkaline bodies; 8. acids; 9. watery liquids, under which are placed rather oddly all sorts of wines and fermented liquors; 10. gases and fumigating vapours; 11. liquid compounds of all kinds, comprehending emulsions, lotions, mixtures, tinctures, medicated wines, ammoniated spirits, syrups, and liqueurs; 12. compounds, neither liquid nor oily, comprehending conserves, electuaries, pastes, poultices, pills, and veterinary balls, lozenges, pastilles, snuffs, and all sorts of pigments, inks, cements, and powders; 13. oily compounds comprehending varnishes, soaps and creams, ointments, plasters and liniments; and, 14. apparatus and chests for pharmacological purposes.

In short, this Supplement must be very useful to many families as well as to chemists, druggists, &c. The composition of most of the patent medicines is mentioned in various parts of the volume.

The last work in our list, the elements of Materia Medica and Therapeutics of Dr A. Todd Thomson, consists of five parts, which are subdivided according to the subjects treated.

In the first part, the author considers the general action of medicinal agents, their effects on the solids, on the fluids, and on the functions, and the modifications induced by original conformations, age, sex, custom, climate, mental emotion, and the period of the disease,

The second is devoted to the classification of agents, under the subdivisions of,—1. animal substances; 2. vegetable substances; 3. the chemical elements of medicinal agents; and, 4. the classifications of different authors.

In the third part the author enters on the proper subjects of Materia Medica and Therapeutics, and delivers in seventeen sections the chemical and therapeutical history of those medicines which operate as vital agents, under the heads of excitants, sedatives, refrigerants, narcotics, antispasmodics, tonics, astringents, errhines, sialagogues, expectorants, emetics, cathartics, diuretics, emmenagogues, diaphoretics, and epispastics.

The fourth part, devoted to chemical agents, embraces the chemical history and therapeutic applications of escharotics, antacids, antalkalies, antilithics, and disinfectants.

The fifth and last part, devoted to the subject of mechanical agents, comprehends the history of the therapeutic employment of demulcents and diluents.

In performing the duty which he has here undertaken, the author has on the whole been studious to present a work at once interesting and instructive. His physiological and pathological principles are in general well founded and distinctly stated, and the therapeutic rules which he establishes are intelligible and rational. Dr Thomson has also been at considerable pains to give full and instructive histories of the clinical experiments recently practised on various medicines, and especially the new chemical preparations.

We think, nevertheless, that the present work does not well bear comparison with those of foreign countries. The author has been much too solicitous to embellish the science of Materia Medica with literary and poetical illustrations, which, however interesting in themselves, are rather out of place in a work of strict science, and necessarily occupy time and space which might have been better applied on other subjects.

We should like to know what are the grounds for the assertion, that the vapour of boiling tar ever cured a single case of genuine consumption. Bronchial inflammation it may remove; but the cicatrization of tubercular cavities is beyond its powers.

We cannot say that we have detected many serious errors or omissions in the statement of facts. But we must avow, that we are astonished that we nowhere see any account of the *Exostemmata* of Bonpland, and their characteristic differences from the Cinchonas, with which they were so long confounded. We also look in vain for any account of *Codeine*, or the *Codeic* acid; and we nowhere see the medical uses of the *Cocculus suberosus* of Decandolle, or *Menispermum cocculus*, Lin., or the Moonseed mentioned.

It is further a great drawback to the work of Dr Thomson, that the scientific names are printed with such unrivalled inaccuracy, that the errors are liable to lead to great mistakes, and will assuredly induce many who know the author merely as a writer to think, that the individual who is so careless about the orthography of scientific terms, may be also not very solicitous about the statement of his facts. Who, for instance, would expect a physician, who is understood to know something of botany, to write *Cytissus* and *Cytissina* (p. 112 and 207,) instead of *Citysus* and *Cytisina*; Cocoloba 37, instead of Coccoloba; Province Rose 70, instead of Provence Rose; *Hyosciamus* and *Hyosciamia* instead of *Hyoscyamus* and *Hyoscyamia*; or *Cantharaden* instead of *Cantharidine*; *Phyceter* instead of *Physeter*; and *Macronata* instead of *Mucronata*, (Vol. ii. p. 644.) Then as to proper names, Dr Thomson disregards all custom and precedent, and gives Mendereri, Braconnet, Seidletz, and Harteloup (ii. 608.)

In a second edition, it will be prudent for the author to rectify the manifold errors of this kind, if he wishes his work to acquire a character of precision.

ART. VIII.—*A Demonstration of the Nerves of the Human Body, consisting of Four Parts.* By JOSEPH SWAN. Part IV. *The Spinal Nerves.* Imperial Folio. London, 1834.

THE present number forms the fourth and last part of the splendid work of Mr Swan on the Nerves of the Human Body. It is devoted to the exposition and elucidation of the origin, connections, distribution, and termination of the spinal nerves, which are thus represented in several large engraved delineations.

The author begins as usual with the spinal chord and the nerves which originate from that body, and represents these with great minuteness and fidelity in the first, second, and third (the 17th, 18th, and 19th,) plates of the number.

Then come the superficial, or cutaneous and muscular nerves of the trunk, in Plate 20th.

These are followed by a very beautiful view of the cervical nerves and the axillary plexus, and the nerves of the palmar surface of the fore-arm, in the 21st Plate; and more minute views of the superficial and deep-seated nerves of the fore-arm in the 22d Plate.

In the 23d Plate, Mr Swan represents the minute anatomy of the superior scapular and circumflex nerves, the nerves of the *complexus* and *splenius* muscles, those of the fingers, and some minute branches of the sciatic nerve.

The 24th and 25th Engravings represent the course and distribution of the nerves of the thigh, leg, and foot, both superficial and deep-seated, so accurately and minutely, that we believe Mr Swan has left little here to be desired.

If we were disposed to be censorious, we might say, that the minute nervous twigs of the foot are represented too large, too regular, and too abrupt. These imperfections, however, we are willing to overlook in the general excellence of the whole.

In short, we must here repeat, what we have already said, that we think Mr Swan evinces infinite merit in the preparation and publication of the present valuable work. The labour and unremitting diligence required for such a work can be known only by anatomists; and, while we consider how few anatomical teachers manifest any inclination for a task so laborious as the present, we acknowledge, that we view the completion of the labours of Mr Swan with the greater admiration.

In conclusion, the publication of this work will go far to raise the character of British anatomists, and diminish much the respectful distance at which they have been hitherto placed from such authors as Walter, Scarpa, and Soemmering.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY.

General Observations on the Arteries of the Duck, from a Treatise on the Arteries of the Duck by Dr **Hahn**. 4to. *Hanover*, 1830. 1. The arteries of both sides, when they approach the median line, unite to form a trunk, which, however, is again divided if the arteries which compose it depart from the median line of the body. This course is perceived in the sublingual artery the palatine, the cerebral carotid on the *sella turcica*, the posterior branch of the deep cerebral, the posterior branch of the posterior cerebellic.

These arteries are for the most part found larger on the right than on the left side. The uterine arteries always arise on the left side. In some the common carotids in their ascent between the muscles of the neck are found united; but in most there is only one carotid artery, which, in the upper part of the neck, is divided into two branches. These, like the carotids in other birds, are distributed to the face and brain. This trunk of the carotids arises in almost all birds from the left *arteria anonyma*, and only in a few instances from the right.

2. In the duck, and, as Dr Hahn thinks, in all birds, or at least the greater number, some peculiarities are observed in the anterior tibial and maxillary plexus, and in the temporal rete. The anterior tibial plexus is like that which is formed by the brachial and crural arteries in the *Bradypus, Lemur tardigradus*, and *Lemur gracilis*, differing, however, inasmuch as, rising from the lower part of the tibia, it sends most of its branches to the tendons, joint, and skin, and few to the muscles. In like manner, the temporal rete is formed by the external ophthalmic artery alone. It is made up, however, of a greater quantity of branches, and is dispersed over more parts. The maxillary plexus differs from these, being composed of three arteries, the branches of which often inosculate with each other, many of them entering the cavity of the nares.

3. The veins are most easily injected from the arteries. On injecting the arteries of the head by one carotid only, all the veins have been filled with the injection; nay, more, in the screech-owl all the veins, even the pulmonary arteries and veins, have been found distended with the injection thrown into the left thoracic artery.

The distribution of the arteries of the duck is as follows.

1st, The aorta immediately sends off the two coronary arteries of the heart, which differ from those of man only in both sending off a high and a deep branch, whereas in man the left coronary alone sends a deep branch to the septum of the ventricles.

2d, The aorta is divided into three branches, or, more properly speaking, into two, a left and smaller branch, called the left *arteria anonyma*, and a right one, twice its size, which is immediately divided into two branches, the right *arteria anonyma*, and the descending aorta.

3d, The common carotid artery sends from its lower part almost all the arteries which in most of the Mammalia arise from the subclavian artery, such as the inferior thyroid, of which the brachial and œsophageal arteries are branches, and the vertebral artery, from which arise the cervical and first intercostal.

Near to these arteries, the superior thyroid arises from the carotid, which appears to be a branch of the same artery in the Mammalia, torn from the trunk, and following the thyroid gland to the lower part of the larynx, so as somewhat to correspond to the branches sent to the skin of the neck and to the œsophagus, which in man arise from the inferior thyroid.

4th, The vertebral artery alone sends branches to the anterior and posterior parts of the neck, with the exception of a few from the cervical arteries.

In the middle of the neck, some of these are enlarged and inosculate with the carotid. Above the atlas, the vertebral artery, leaving the vertebral canal, does not enter the cranium, but inosculates with the deep branch of the occipital.

5th, The common carotid artery, while ascending on the neck, gives off no branches, except in its superior portion a muscular branch, and the superior cervical artery, which corresponds to the cervical branch of the occipital artery in Mammalia. In the duck this artery is sometimes a branch of the occipital. At length the common carotid artery divides into the facial and cerebral, or, to speak more correctly, into an anterior and posterior branch. The anterior branch sends off most of the branches which in Mammalia arise from the facial carotid. The posterior branch of the carotid sends off the occipital artery, and then divides into the external ophthalmic and cerebral carotid. The arteries sent off by the anterior branch of the carotid differ from the same vessels in Mammalia in their distribution, and in some of those branches given off by these arteries in the Mammalia, being either wanting, or diminished, or enlarged, which appears to depend on the difference of structure in the bones and soft parts of the head of birds. The hyoid and superior laryngeal seem to correspond to the superior or laryngeal branch of the superior thyroid artery in man. The lingual artery corresponds to the same artery in man, but gives off the submental, which in him arises from the external facial. The internal maxillary is less in the duck than in a man. Many of the branches sent off from this artery in man are wanting in the duck. Some arise from other arteries, especially those which in man are sent off from the lower part, instead of which there arise from it in the duck the pharyngeal arteries, corresponding to the ascending pharyngeal artery arising in man from the facial carotid, and the anterior nasal artery, which in man is a branch of the external facial. The facial artery is greater in the duck than in man. After giving off an artery corresponding to the posterior and deep auricular artery in man, it divides into the internal and external facial, the former corresponding to the lower part of the internal maxillary artery in man. From it arise the inferior alveolar artery, and branches to the masseter and temporal muscles. At length it is lost in the maxillary plexus. The pterygoid artery is a branch peculiar to it. The external facial artery is distributed to the face. Its branches, the coronary arteries, are slender, and as it were the rudiments of the same arteries in man.

On the top of the beak, their place is supplied by branches from the palatine and sublingual arteries. The anterior nasal does not arise from the external facial, but instead of that the middle auricular, the anterior palpebral, the external nasal, and the frontal are given off.

The posterior branch of the carotid gives off the occipital artery, the course of which is the same as in man, with the exception of its inosculating with the vertebral. In man, too, the occipital sometimes arises from the cerebral carotid. At length the posterior branch of the carotid divides into the cerebral carotid and external ophthalmic, which appears to be composed of the temporal, many branches sent off in man from the internal ophthalmic, and some from the internal maxillary. The branches given off by this artery in the duck are the occipital, (the posterior temporal artery in man,) the temporal, and an artery from which branches proceed to unite with others from the temporal rete, and form the inferior alveolar plexus. There then arises from these arteries, and the external ophthalmic, the temporal plexus or rete, which is distributed into other plexus, the lowest of which, viz. the inferior alveolar plexus, the plexus to the adductors of the lower jaw, and the middle meningeal, arise in man from the internal maxillary; the anterior comprehending the inferior palpebral plexus, the lacrymal, and the branch which goes to the orbit, arise in man from the internal ophthalmic. In fine, the superior or temporal plexus arises in man from the temporal artery. At length the external ophthalmic gives off the ethmoidal branch, (which, uniting with the internal ophthalmic, forms the ethmoidal artery corresponding to the anterior ethmoidal branch in man) after it is dispersed in the orbit. The cerebral carotid, before it goes to the brain, sends off the sphenoidal and spheno-maxillary, the former of which corresponds to the branch which the cerebral carotid in man sometimes sends to the pharynx. Going to the *base* of the cranium, the cerebral carotid by itself forms the circle of Willis, which differs from that in man only in its anterior part being formed by the artery of the *corpus callosum*, and the posterior part by the basilar artery. The arteries sent off to the brain by the cerebral carotid of the duck correspond in number to those of man, but differ in distribution. The greatest difference is in the internal ophthalmic, which enters the orbit not with the optic nerve, and after distributing only a few branches to the optic nerve, and the first branch of the fifth pair, and muscles of the ball, and uniting with the ethmoidal branch, forms the ethmoidal artery. This artery sends a few branches to the supra-orbital glands, the superior palpebra, and the third membrane, and distributing some supra-orbital branches to the skin covering the forehead, enters the cavity of the nares. It appears to correspond to the supra-orbital and posterior ethmoidal arteries of man.

6th, The subclavian, the other branch of the *arteria anonyma*, is very short, and does not give off the same branches as in the Mammalia. The most of these arise from the common carotid, the internal mammary artery being a branch of the thoracic. In the duck, the subclavian sends off only one artery, the sterno-acromial, corresponding to the acromial in man. It then divides into the axillary and thoracic. The thoracic sends off the internal mammary and branches to the *pectoralis major*, the neighbouring muscles, and integuments of the thorax. The axillary furnishes a muscular branch and the anterior scapular artery. The *dorsalis scapulæ* is derived from the first intercostal. Taking the name of brachial, the artery runs towards the antibrachium, giving off branches in the same way as in man, but fewer in number. Thus it furnishes only one collateral artery, and that the radial, the ulnar collateral being a branch of the profunda. At the articulation of the antibrachium, the brachial divides into two branches, one corresponding to the ulnar, and the other to the interosseous and radical. The latter runs on the interosseous membrane, giving off branches in its descent, and ends in the digital arteries. The distribution of the radial and ulnar arteries at and below the carpus resembles very much what occurs in man, with the exception of their not forming an arch.

7th, The descending aorta cannot be divided into thoracic and abdominal as in Mammalia, on account of the different situation of the diaphragm.

It may be mentioned, however, that the superior part of the vessel corresponding to the thoracic aorta of the mammalia, sends off no branches. Opposite the seventh dorsal vertebra, it sends off the cœliac artery, the distribution of which is the same as in man, except that it divides into two gastric, which give off the hepatic and splenic. In the stomach no coronary arteries are observed, but the cardiac supplies the place of the left. The only difference in the superior mesenteric arteries is, that no arch is formed before they are distributed to the intestines, and they end in the superior hæmorrhoidal arteries. There is no inferior mesenteric artery. The spermatic arteries correspond to the same vessels in the Mammalia. There are three renal arteries, one from the aorta, and the other two from the ischiatic. The aorta, as in other birds, is not bifurcated at its termination. On a level with the lowest part of the ilium, it gives off the crural, which furnishes the gluteal and the umbilical. The umbilical sends off the epigastric and obturator arteries; and in the female, on the left side, the superior uterine. The aorta then descending on the sacrum, furnishes the lateral sacral, the ischiatic and common pudics, and terminates in the middle coccygeal artery. There are no hypogastric arteries at all. The common pudic arteries differ much from those of man, from the organs to which they are distributed being situated in the cavity of the pelvis, and from the pelvis itself being differently formed. Besides the middle hæmorrhoidal and muscular branches, the common pudic sends off the *profunda penis*, the lower hæmorrhoidal, the external pudic, and in females the middle uterine, all which in the Mammalia arise from other arteries. The middle coccygeal artery is greater than in many of the Mammalia, on account of the powerful muscles attached to the coccyx.

8th, The crural artery differs much from the same vessel in the Mammalia, for it sends off the umbilical and gluteal, the latter seeming to correspond to the circumflex artery of the ilium. Proceeding to the muscles of the thigh, the crural artery sends off a branch, which Dr Hahn calls the *profunda*, though it answers rather to the internal circumflex artery of the thigh. Nothing analogous to the external circumflex artery has been detected. The crural ends in the extensor muscles, and its branches do not proceed beyond the knee-joint. The other artery of the thigh, viz. the ischiatic or posterior crural, after giving the renal and obturatory branches, passes through the sciatic foramen to the back part of the thigh, and, after furnishing branches to the adductor muscles, ends in the popliteal artery. The popliteal sometimes gives off a muscular branch, and divides sooner than in man into branches, anterior and posterior tibial. These differ much from the corresponding arteries in man. The *tibialis antica*, the larger of these, furnishes the superior articulating arteries of the knee, the internal gastrocnemial, and the peroneal which, sending off the internal articulating asteries and some muscular branches, merges in the tibial plexus. After forming this plexus, the *tibialis antica* descends to the articulation of the foot, and, taking the name of the metatarsal artery, sends off the perforating arteries, and terminates in the digital, corresponding in some degree to the plantar arteries in man. The *tibialis postica* is much less than the *tibialis antica*. It sends off the gastrocnemii and some muscular branches, and terminates in the posterior articulating arteries of the foot.

In the duck, the tibial arteries give off more branches in the leg and fewer in the foot than in man.

New Researches on the Composition of the Serum of Human Blood, by M. Felix Boudet. (Journal de Pharmacie, No. vi. June 1833.) Critical and Chemical Essay on the Blood, by M. Felix Boudet. Form of the globules; existence of cholesterine, and an alkaline soap in the serum, and the discovery of seroline, a new principle.—The object of these researches is to determine the nature of the relation between the globules of the blood and the colouring matter and the serum, and to ascertain the chemical constitution of the latter fluid. M. Boudet takes a general view of all the representations which have been given of the nature of the globules, from the time of

Leeuwenhoeck to that of Hewson, Home, Prevost and Dumas, Young, and lastly, Raspail, Donné and Muller. It is well known that Hewson represented the globules as flat orbicular or circular bodies, like coins, but with prominent centres, and that the observations of Prevost and Dumas are in favour of the same idea. Home, on the other hand, inferred, from what he conceived careful microscopic observation, that they were minute spherical bodies, consisting of a central globule, enveloped in colouring matter during life. This idea was also maintained by Young, who considered the central *umbilicus* or prominence as an optical illusion.

The general tendency, in short, of different observations on the constitution of these minute and problematical bodies appears to be, that they consist of two concentric spheroids. The separate and essential existence of the inner spheroid appears to be established, especially by the experimental observations of MM. Prevost and Dumas, and M. Donné and M. Muller. Thus the first inquirer found, that, if dried blood was diluted in a saline solution, the central globules were easily recognized; and that, conversely, when the blood was diluted with pure water, the colouring matter was dissolved, or rather divided in this fluid, and the internal spheres appeared then to be colourless. Donné found, among numerous microscopical observations, that, whether he operated on human blood, or that of the frog, the globules were effaced, indeed, when diluted with water on a glass plate; but that, if he waited till the colouring matter had spread over the margins of the plate, he then observed these globules colourless and transparent floating in the fluid, and that it is absolutely impossible to dissolve them in a large quantity of water within a space of more than twenty-four hours. M. Donné, in short, regards the globules as minute bodies of a lenticular shape, formed of a fundamental tissue of fibrine, in the interstices of which albumen and colouring matter are deposited.

Lastly, in a letter recently addressed to the Institute, and inserted in the *Annales des Sciences Naturelles*, (*October*, 1832, p. 222,) M. Muller adds the following confirmatory statements, derived from the blood of frogs. "The globules of blood are composed of a colourless *nucleus* and red crust, which undergoes gradual solution in pure water, but not in salt or sugared water. After the solution of the red crust in water, the central *nuclei* remain insoluble in simple water, but are dissolved in alkaline water. The most effectual mode of detaching these *nuclei* from their red capsules, is to mix a drop of acetic acid with a drop of blood from a frog, or any other animal, and to observe the effect microscopically. The red crust is instantly dissolved in the acetic acid, while the elliptical *nuclei* remain, and may be examined in their proper form."

From all these testimonies, combined with his own observation, M. Boudet infers, that, whatever discordance prevails on other points, it is certain that the globules of the blood consist of two substances,—a colourless and a red colouring matter, and that in configuration they form two concentric spheroids. To us it appears from the facts more natural to represent them as consisting of a central spheroid, and an inclosing spheroidal capsule,—both concentric.

On the diameter and size of these globules, M. Boudet merely repeats the inference formerly established by several observers, that though these diameters vary in different species, and much more in different animals, they are invariably the same in the same animal. This might demonstrate the impropriety of transfusing the blood of an animal of one species into the vessels of an animal of a different species. The odorous principle of the blood, he is of opinion, depends on the presence of some volatile acid substance, analogous to those which were found by Chevreul in adipose substances. This opinion derives some probability from the fact, that M. Matteucci, in distilling the serum of goat's blood with sulphuric acid, obtained a mixture of lactic and caproic acid.

On the important question, as to the state in which the fibrin exists in blood, M. Boudet rejects as untenable, the common opinion, that this principle forms part of the globules, partly in consequence of the experiments of M. Le Canu on the colouring matter of the blood, and partly by reason of the experiments of M. Muller, which are entirely at variance with such a supposition.

This observer maintains that the fibrin in the coagulable part of the blood is not contained in the globules, but is dissolved in the serum. To demonstrate this inference he selects the blood of recent frogs, the globules of which are too large to pass through the pores of filters. Having amputated the thigh of a frog, he causes the blood to fall on a moistened filter, and mixes with it an equal quantity of pure water, or rather of sugared water. There escapes a clear liquid, in which is quickly formed a clot of fibrin, which is speedily condensed and becomes white. The globules in the meantime remain on the filter, unchanged and undissolved if sugared water have been mixed with the blood. From this experiment it results, that the coagulation of the blood is not justly explained by referring it to aggregation of the globules. This experiment succeeds in summer, spring, or autumn, but not in winter, because the blood of frogs does not coagulate at this season.

These experiments, M. Boudet infers, concur in showing that the fibrin exists in the *serum* in a state of solution.

M. Boudet has further detected in the blood, at least, its *serum*, the presence of three principles,—two entirely new, which had hitherto escaped analytical examination; and he is led to express the opinion that, as it was only by operating on very large quantities that he discovered the principles alluded to, it is necessary to have recourse to a new mode of analysis, as the circulation and repair of the blood are so rapid that any given quantity taken at any particular point of time may contain mere traces of the substances found to exist. He further thinks, that, if examined in this manner, the blood must contain not only the materials of all the organs, but even the characteristic principles of the different secretions, as cholesterine, urea, &c.

The substances next found in the human blood by M. Boudet are,—1. an alkaline soap; 2. cholesterine; and, 3. a fat substance hitherto unknown, and to which he applies the distinctive name of *seroline*.

These substances were obtained in the following manner.

A large quantity of *serum*, formed by the combination of three bloodlettings, being dried by a gentle heat, washed by boiling water, and dried again, was reduced to powder, and treated with boiling alcohol. The alcoholic liquors which had been colourless, became turbid on cooling, and from them were precipitated very slowly white *flocculi*, separable by the filter. These flocculi, which presented the aspect of little adipose pearly plates, slightly translucent, but without crystalline form, were the new principle denominated *seroline*.

Viewed by the microscope, these adipose whitish pearly plates seem to be formed of filaments, swelling at intervals with minute white opaque globules, which give them the aspect of chaplets or strings of beads.

Seroline melts at + 36° = 97° F. evinces no reaction on reacting papers, and reddens, like cholesterine, in contact with concentrated sulphuric acid.

It does not form an emulsion with cold water, and if warmed it swims on the surface of the fluid in the form of a colourless oil.

It is readily dissolved by sulphuric ether even in the cold. It is in no degree affected, or the contrary, by alcohol in the cold, and traces only are dissolved in that fluid at 36° = 92° F. and at ebullition.

Subjected to warm *aqua potassæ* for six hours, it undergoes no change, and hydrochloric acid causes no precipitate in such alkaline liquor.

Long heated with nitric acid it is not dissolved, but becomes soluble in *aqua potassæ*, which then acquires a brown colour.

Distilled at the lamp in a glass tube, it emits a very characteristic odour, furnishes alkaline vapours, is partly volatilized, and leaves a carbonaceous residue.

The alkaline soap and cholesterine were obtained in the following manner.

The filtered liquor distilled in the sand-bath, and reduced to one-fourth of its volume, exhibits, upon cooling again, a milky turbidity, yet without remarkable precipitate.

The evaporation being continued, furnishes a residue of a yellowish-brown aspect, of the consistence of turpentine, forming with cold water an emulsion of a bitter taste, and a smell analogous to that of the phosphorated fat of the brain.

This residue triturated cold with alcohol at 36° = 97° F. gave it a yellow colour, and became attached to the tube in the manner of a soft resin. The alcohol was renewed till it ceased to acquire colour, and the mixture was then separated into two distinct products; one soluble in alcohol, corresponding to the only matter of M. Le Canu, the other insoluble in the fat matter of the brain.

From the first of these left to itself were precipitated, at the end of a certain period, minute crystalline plates, of an appearance analogous to that of cholesterine, and which, indeed, present no material difference of character from that substance.

When the serum after this precipitation was decanted and evaporated to dryness, it furnished a viscid residue of a bitter taste, very soluble in alcohol, and retained some cerebral fat, which was afterwards detached as far as possible by the aid of alcohol, at 22° = 72° F., which appeared to M. Boudet to exercise no sensible influence on the substance. Lastly, he dissolved it in ether, which separated from it some traces of saline matters.

Thus purified, this new product was soft, sensibly transparent, of a bitter saponaceous taste, a little altered by the taste of the phosphorated fat, very soluble in alcohol and ether, sensibly soluble in water, cold or hot, and rendering it mucilaginous, like a genuine soap, and speedily restoring the blue colour to turnsol, reddened by acid. From these characters M. Boudet felt it impossible to mistake this substance for an oily matter, and most probably in the shape of a genuine soap. He afterwards confirmed this inference by the addition of hydrochloric acid to the watery emulsion upon which drops of oil came to the surface. He regards the soap as a probable mixture of oleic and margaric acids.

M. Boudet regards the oily matter of M. Le Canu as partly alkaline soap, partly *seroline* and cholesterine.

Worms in the Blood.—History of a Case in which Animals were found in Blood drawn from the Veins of a Boy, with Remarks, by J. STEVENSON BUSHNAN, *F. L. S., Surgeon to the Dumfries Dispensary.* London, Edinburgh, 1833, pp. 74.—A boy, 8 years of age, living on the banks of the Nith, the waters of which he had always drank, "was visited professionally in June last by Mr Bushnan of Dumfries, who found him labouring under influenza, at that time epidemic."—"He complained of great headach, his pulse was full and strong, and 100 in the minute." The mother of the patient, when she requested Mr Bushnan's advice, informed him that her son had been bled, and that fifteen worms had been found in the blood drawn; one of which she produced in a cup of water. The worms were stated to have been visible in the blood in less than a quarter of an hour after it had been drawn.

Mr Bushnan deemed it expedient to abstract about six ounces of blood, in which he could discover nothing preternatural. He covered it with a basin in such a way as that it could not be disturbed without his knowledge.

In an hour afterwards he found five animals swimming in the serum, all most vigorous and lively. On dividing the clot, the animals made powerful efforts to disengage themselves from it. Eight were disengaged, making with the five discovered in the serum, and the fifteen obtained by the previous bleeding, twenty-eight. Specimens were sent immediately to Mr Rhind, the naturalist. who gives the following description of them.

"The animals I received from you lived with me two days, in a little blood serum, when I had an opportunity of examining them most attentively. They are from about half an inch to six or eight lines in length, when dead the bodies relax and become about one inch long. They consist of an articulated body of eleven joints, of a head with rudiments of four organs, (antennæ and palpi,) with an appendage immediately below the articulation of the head, which is ciliated and very similar to the respiratory tubes at the other extremity. The tail terminates in two tubular bodies or stigmata, having ciliated margins; they are the external respiratory organs; besides these, there are two or three bands on each side. which are mere fleshy appendages. Within the articulated body extending on each side from the tail to the head, the respiratory organs are distinctly visible with the aid of a microscope. They consist of a continuous tubular structure, of a pale silvery colour, through which the air passes. The colour of the animals is bright-red. These animals exactly correspond in structure, colour, and size to the larvæ of the *Tipula oleracea* which in summer is so abundantly found in ditch or river water. The eggs of these flies are very minute. and at a certain season of the year are deposited in great numbers in running water, by the Tipula fly, well known by its long legs and slender body. The worms cannot be mistaken for any of the Entozoa of the human body, or of other animals, because they have distinctly formed aerating organs, which intestinal worms never have been discovered to possess. They are in many points entirely different. Their red colour is a specific distinction, and not likely to be accidental, from the colour of the fluid in which they were formed, and on which they appeared to feed. They also seemed to respire equally well in the blood serum as in water, for I could distinguish a constant succession of air globules in their respiratory tubes." The short monograph from which the above account is extracted contains a brief view of the narrations given by various authors of similar occurrences, and a discussion of the various theories of their formation, to which, as we have not space here, we must refer the reader.

SURGICAL PATHOLOGY.

1. *Wound of both Femoral Arteries without Hemorrhage.*—LARREY, *Histoire Chirurgicale du Siege de Citadelle d'Anvers.*—An artilleryman, while standing with his legs asunder near a cannon which he was preparing to sponge, was struck by a bomb, which burst, passed between his thighs from behind forward, without fracturing either femur, and tore all the soft parts situated at the middle-third of the internal and posterior side of these members. No hemorrhage ensued, though the two femoral arteries appeared, amid the havoc of the soft parts, completely divided, and exhibiting a motion altogether erectile. The pulsations of both were very perceptible superiorly, till within three or four lines of the divided extremities, where a sort of resistance to pressure was felt, as if the orifices of the two arteries had been stopped by a foreign body. It was true torsion of the vessels. It is almost needless to add, the patient did not survive.

2. *A Case of Scorching by Electric Fluid. by* M. VOLPELIERE of Arles, *from Journal de Medecine Pratique, October* 1833.—A very delicate woman, 68 years of age, of a nervous bilious, temperament, while closing her window on the evening of 26th May 1829, during a violent thunder-storm, with

torrents of rain, was struck with lightning. The electric fluid proceeded from the iron fastening of the window along her left hand and sleeve, till it reached her shoulder, whence it descended along the thorax, abdomen, groin, internal part of the thigh and leg, to the sole of the foot, keeping always on the same side. She fainted, fell backwards, and sustained a contused wound in the occipital region. After remaining an hour in this state of stupor, she with difficulty got up, and threw herself on her bed till day break, when she called her neighbours. On visiting her soon after, M. Volpeliere found her with a wandering countenance, feeble concentrated pulse, and cold skin. All the parts touched by the electric fluid were scorched. In some places the epidermis was raised, and the thigh presented an erysipelatous redness. Simple cooling dressings were applied, and a stimulant exhibited. On a second visit, the strength was a little restored. On examining the patient more minutely, it appeared that the skin had acted as the conductor of electric fluid. The sleeve of the shirt was not burned, except at the shoulder, where, at the time of the accident, the arm formed with the body an angle of 46°. She had a cloth under-vest lined with scarlet, Wherever the electric fluid had been delayed for a longer or shorter period, the scars were larger and deeper. The wrist, shoulder, upper part of the pelvis, were severely burnt. The inner surface of the thigh, at first of an erysipelatous red, presented soon after the reaction an enormous wound. The leg confined by the garter did not arrest the course of the fluid. There were observed here only two holes, one below the knee, and the other above the *malleolus internus*. Reaction took place several times, but was subdued by abstinence. After the separation of the eschar, the cicatrization of this enormous wound took place; but upwards of two months after the accident, the patient died of gastro-enteritis.

Notice to Students of Medicine.—At the annual business meeting of the Harveian Society of Edinburgh, held this day, it was decided, that the best essay given in for competition, on the subject advertised last year, viz. "on the changes which the blood undergoes in inflammation." was the one bearing the following motto: "Omnibus in terris, quæ sunt a Gadibus usque Auroram et Gangen, pauci dignoscere possunt vera bona," *Juvenal*, Sat. x.; and on opening the corresponding sealed letter, it was found that Mr William John Irvine was the author; consequently Mr Irvine was declared the successful competitor.

The Harveian Society has fixed on the following subject for the prize essay for the year 1835, viz. "the influence of atmospheric pressure on the animal economy."

Dissertations on this subject must be transmitted to either of the Secretaries, on or before the 1st day of January 1835. Each dissertation must be accompanied by a sealed letter, containing the name and address of the author, and inscribed on the back with a motto. The same motto must also be prefixed to the dissertation to which the letter belongs.

The prize given by the Society to the successful candidate, is either a copy of the quarto edition of Dr Harvey's works, published by the College of Physicians of London; or a silver medal, with a suitable inscription, at the option of the candidate. The prize is presented to the successful candidate at the annual festival in April.

The candidate is at liberty to employ his dissertation afterwards, in any way he may think proper: And accordingly, some dissertations presented to the Harveian Society, have, in consequence of publication, been productive of considerable honour and emolument to the authors.—By order of the Society,

WILLIAM MONCREIFF, M. D., 7, York Place, }
RICHARD HUIE, M. D., 8, George Square, } *Secretaries.*

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